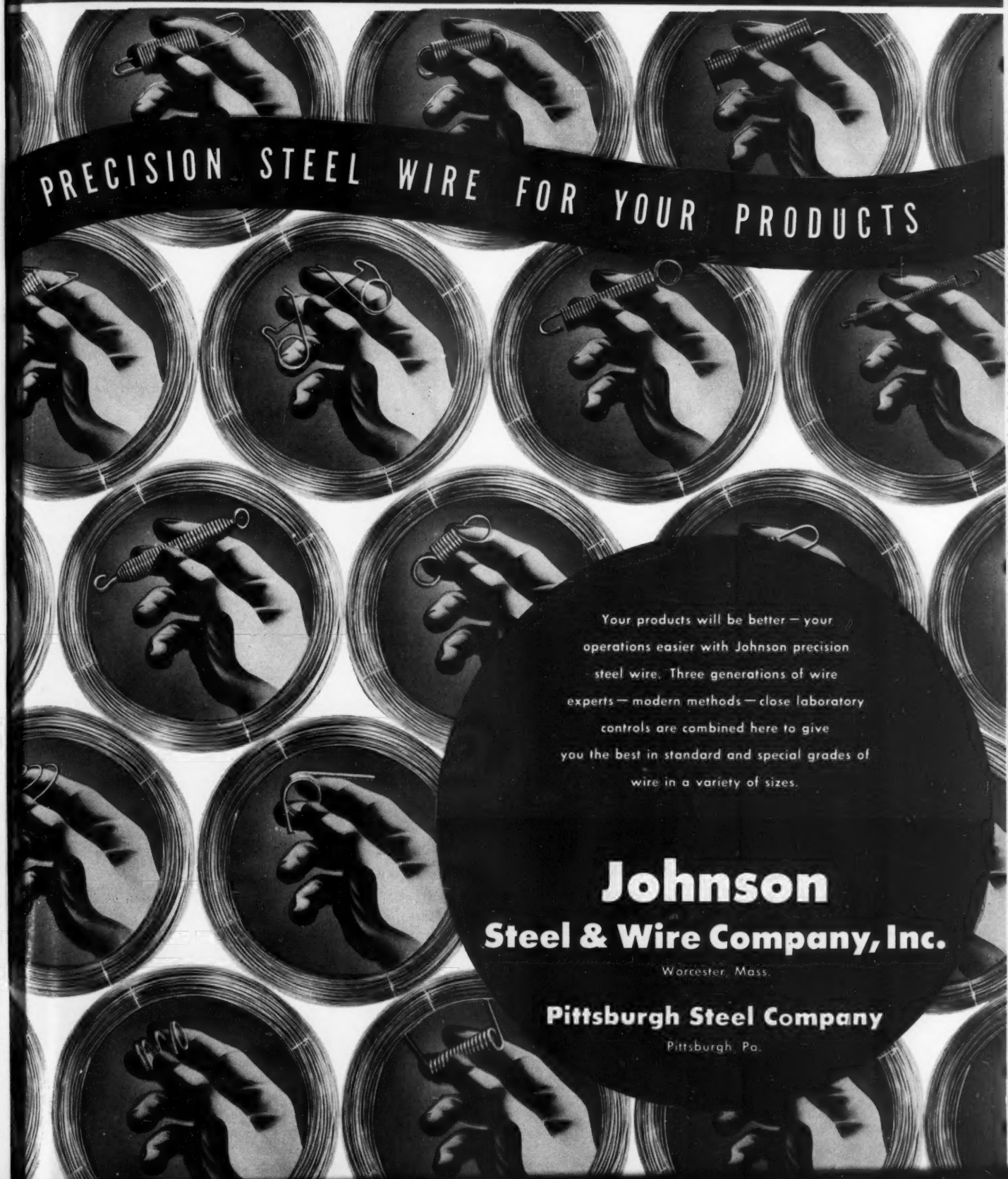
STEEL

The Magazine of Metalworking and Metalproducing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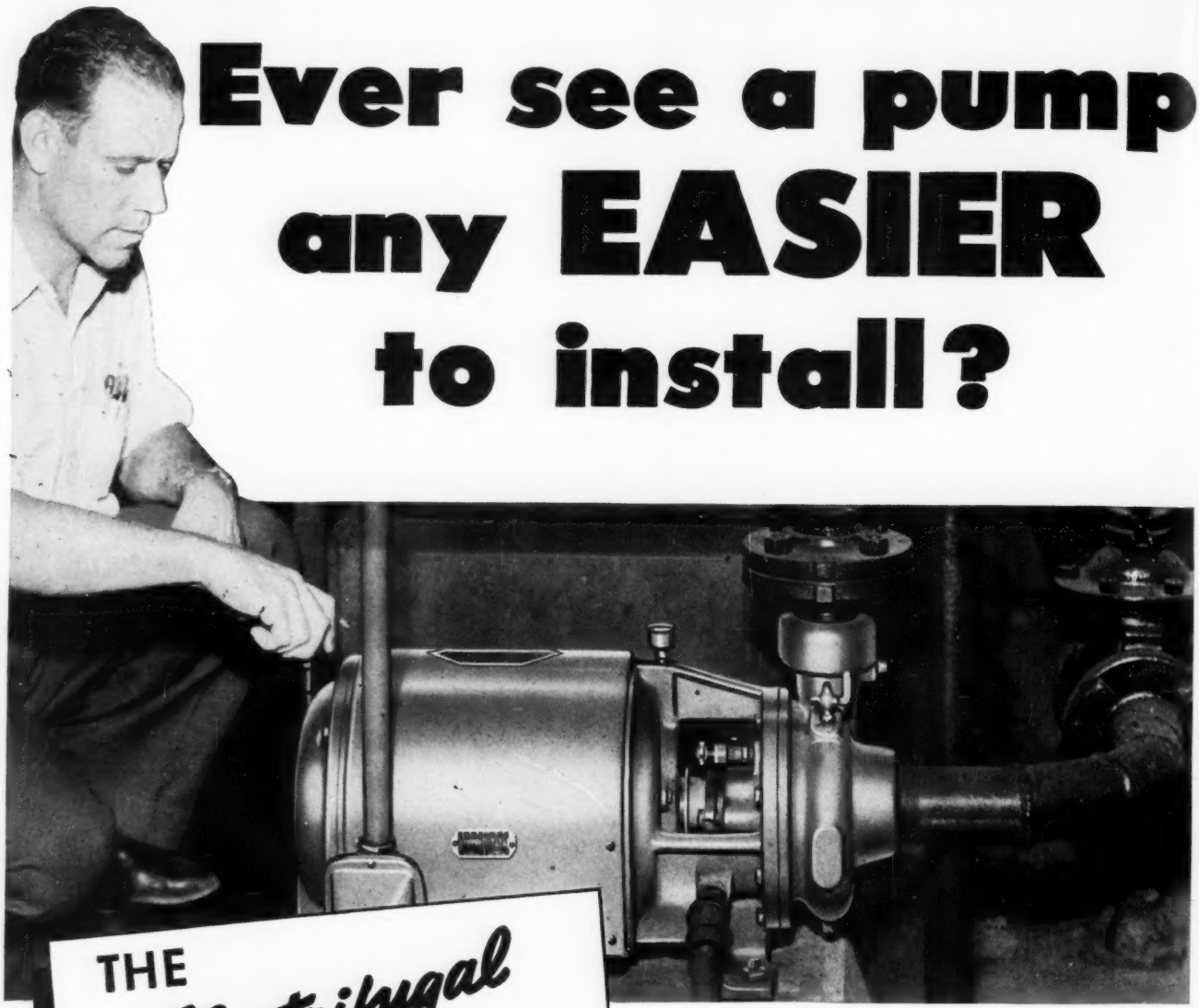

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The Magazine of Metalworking and Metalproducing

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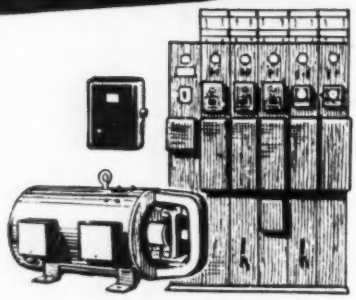

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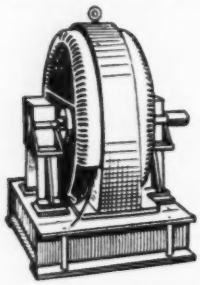

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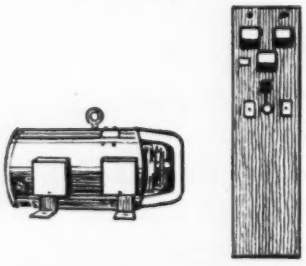

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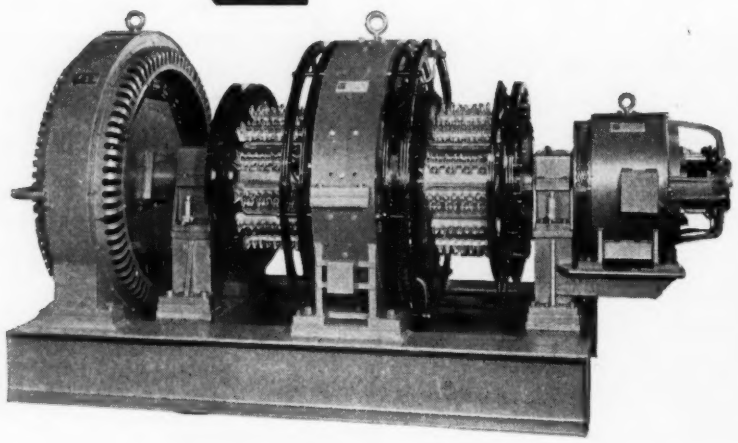

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EP X-38

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November 1, 1948

Americana

Had it been possible for Joseph Stalin and other members of the Politburo to have been visiting in the United States last week, they could have observed the operation of two typically American institutions—the American presidential campaign and the American annual convention and exposition.

It would have been enlightening for our visitors to hear campaign oratory, to see the reaction of crowds and particularly to observe the complete freedom with which issues and personalities are discussed in meetings, in print and on the radio. From this very freedom, Mr. Stalin and his associates might have gained the impression that the people of the United States are so sharply divided as to conflicting political beliefs that they are incapable of acting unitedly for the good of the nation. If he and his party considered this to be a sign of national weakness, then they would be making the identical mistake that was made by the Kaiser, Hitler, Mussolini and Hirohito.

If the Stalin party had gone to Philadelphia, its members would have seen the American annual convention and exposition in its highest state of development. They would have been impressed by the potential represented by the display of materials and equipment at the exposition and by the technological progress reflected in papers presented at meetings of the American Society for Metals, American Welding Society, Institute of Metals Division of AIMME and Society for Non-Destructive Testing. They likewise would have been impressed by the "Salute to Alloy Steel" and by the presentation of distinguished service awards to men who have made outstanding contributions to the development of alloy steels.

Most important, they would have perceived in activities of the 30th National Metal Congress and Exposition a unity of purpose among thousands of professional, operating and management men to help make this a better world in which to live. Members of the Politburo would have had no difficulty whatever in recognizing this unity as a sign of tremendous national strength. They would respect it highly.

If Stalin and his cohorts could understand the mood of our people as well as they understand the strength of our scientific and economic attainments, there would be no occasion to fear an early war.

* * *

STOP, LOOK AND LISTEN: Members of the Non-Ferrous Founders' Society have notified War Assets Administration of their intention to bid on government-owned aluminum reduction plants at Massena, N. Y., and Riverbank, Calif. Back of this move is the conclusion by nonferrous foundrymen that shortage of primary aluminum ingot and high price of secondary ingot are the gravest problems confronting their industry and that relief is not in sight. Therefore, they feel they must resort to purchasing reduction facilities to be operated on a co-operative basis.

The idea of buying furnaces and mills to insure a reliable source of supply of scarce metallics is not new. Individual fabricating and consuming companies, and syndicates of such companies, have been purchasing production facilities since the war ended. However, the nonferrous founders' proposal comes closer to being a true co-operative than any of the previous acquisitions.

Without in any way criticizing consumers who are forced by unusual conditions to go to extraordinary lengths to procure vital materials, one may ask—as a hypothetical question—what

(OVER)

would happen if this urge to insure a source of supply through purchase were pursued to its logical conclusion. We would wind up with a superabundance of captive furnaces, mills and other facilities, many of which would cause acute headaches in a buyers' market.

No simple formula will fit all the conditions of those who are plagued by scarcities of materials. Some can buy protection of supply advantageously; others can buy to ease a temporary crisis only to be plunged into difficulties later. It is a situation which calls for sound judgment and, in most cases, extreme caution.

—p. 51

* * *

MORE PLANT EXPANSION: Final week of October witnessed more than the usual volume of announcements of important plant expansion.

Jones & Laughlin Steel Corp. will build six open-hearth furnaces at Pittsburgh, increasing annual ingot capacity by more than 400,000 tons. With additional finishing facilities, the expansion program will involve an expenditure of $70 million. McLouth Steel Corp., Detroit, will spend $18.5 million on an expansion program involving a fully integrated steelworks, with electric furnaces, soaking pits, blooming mill and finishing facilities, at Trenton, Mich.

Fisher Body Division of General Motors announced plans for a blanking plant at Ambridge, Pa., and a stamping plant in Mifflin Township on the outskirts of Pittsburgh. Although a Fisher Body spokesman said that "it will be to the mutual advantage of ourselves and to the steel companies to be situated at Pittsburgh," some observers believe mill pricing may have been a factor in selecting Pittsburgh sites for these plants. —p. 49

* * *

POLL ON NEW PRICING: Whether or not Congress will take a hand in designating legal forms of pricing will depend to a considerable extent upon the testimony presented before the Capehart committee. Senator Capehart seems to be convinced that clarifying action by Congress is desirable. He and Secretary of Commerce Sawyer have advised business men to make no drastic change in pricing policies until Congress has had an opportunity to consider the problem.

Meanwhile, there are wide differences among indicators of the reaction of industry to mill pricing. Letters received by the Capehart committee are said to be running in the ratio of 497 to 3 against mill pricing. Visitors to the Metal Show in Philadelphia last week answered this publication's question, "Are you in favor of the new f.o.b. mill pricing system on steel products?" as follows: Yes 401, No 442.

Apparently much depends upon how the question is phrased and by whom it is answered.

—pp. 52, 53

* * *

RAINBOW OVER EUROPE: Almost every report of industrial activity from England and Western Europe, except France, is encouraging. Coal output, which has lagged deplorably since V-E Day, finally has gained momentum in Britain, in the Ruhr and in other sectors except France, where Communists have dealt a body blow.

Steel output in Bizonal Germany hit a postwar high in October. Export activities in Britain, Belgium, Bizonal Germany and Sweden are increasing. Lloyd's Registry of Shipping reports that world merchant shipbuilding established a peacetime record in the third quarter, with 4,205,714 gross tons under construction.

This recovery undoubtedly has been helped by ERP, but much credit belongs to the enterprise of industrialists in the stricken nations. The rainbow now hovering over Western Europe may mean that future assistance required from ERP may be less than we had anticipated.

—pp. 59, 60

* * *

KEY TO ECONOMIES: In connection with a new cold-reduction mill and finishing facilities just completed by Columbia Steel Co. at Pittsburg, Calif., it is not surprising to find that strong emphasis has been placed upon materials handling.

Features of the tinning operations in the new plant include the use of automatic feeding and electrolytic pickling of sheets at the tin stacks to eliminate manual handling and white pickling; also assorting, counting, weighing and packaging tin plate in a continuous line in tandem with the tin machine to avoid manual handling in inspection and tractor handling of the unpackaged finished product.

Clearly the trend in new plants is toward automatic feeding and handling wherever manual operations can be eliminated at a saving in costs. In almost every type of installation of major equipment, efficiency in handling is the key to important operating economies. —p. 100

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

STEEL EXPANSION— One of the largest postwar steel expansion programs has been announced by Jones & Laughlin, which will build six large new open hearths at Pittsburgh. Rated capacity of the new furnaces will be 780,000 tons annually; they will give J & L a net increase of 400,000 tons of ingot capacity, after certain obsolete, high-cost units are abandoned (p. 49). McLouth Steel Corp. will double its capacity and integrate its facilities. Other steel expansion plans, not yet announced, are going ahead, despite almost prohibitive construction costs.

FREIGHT CARS— New orders for freight cars have slumped (p. 51) and carbuilders are somewhat at a loss to explain why. Railroads blame high prices, but admit that a falling off in carloadings and inroads in traffic by truck carriers may be contributing causes. Meanwhile, the way has been opened to continue allocations of steel to the freight car and other civilian allocation programs through next September (p. 52).

INDUSTRY CO-OPERATIVE—Nonferrous foundries have been having trouble obtaining sufficient supplies of aluminum ingot. Last week they decided to do something about their problem by forming a co-operative to buy and operate a surplus government aluminum ingot plant (p. 51). One group of steel consumers already has taken similar action, and a co-operative by ferrous foundries to acquire and operate a pig iron plant has been proposed.

METAL SHOW— Thousands of metalworking engineers, metallurgists, operating men and executives gathered at Philadelphia last week for the 30th National Metal Congress & Exposition (p. 53). Displayed were scores of new developments. Special attention was paid to alloy steel.

Visitors at the show, polled by STEEL, were overwhelmingly for Dewey for President, said they needed more steel, but were fairly evenly divided on the merits of f.o.b. mill pricing. The latter vote possibly is explained by the fact that most visitors were technical rather than commercial men.

PATIENT IS BETTER— Europe is responding well to treatments of American aid and is asking for more of the same (p. 59). Production and trade are on the upswing. World merchant shipbuilding hit peacetime peak during the third quarter. Belgium is doing a thriving steel export business, even in the United States. Western Germany's steel output is rising gradually.

TAX OUTLOOK— Two new revenue bills are being prepared by the House Ways & Means Committee for introduction soon after the 81st Congress convenes (p. 56). One will be a general tax revision bill similar to that approved by the House at the last session; the other will be an excise tax bill. Neither will raise or lower taxes appreciably, but are designed to clarify and establish permanent peacetime policies.

FOURTH ROUND— Another round of wage increases will be asked by the big unions (p. 61) in 1949. American Federation of Labor has just served notice on industry that its members will seek higher rates. Earlier, John L. Lewis had announced the coal miners would make new wage demands.

HERE AND THERE IN INDUSTRY— Fisher Body Division of General Motors is locating two new plants in the Pittsburgh district (p. 50), indicating GM believes mill pricing is here to stay . . . . Gear manufacturers were warned (p. 52) that melting of backlogs indicates more selling is necessary . . . Cadillac's new engine (p. 63) has 7.5 to 1 compression, weighs 200 pounds less but develops more horsepower . . . Machine tool orders for September (p.60) were the lowest for the year . . . Unemployment is hovering around the peacetime low (p. 61) and labor recruitment will pose a difficult problem should this country become involved in an emergency.

Engineering News, p. 77 *Market Summary, p. 139*

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J&L To Build 6 New Open Hearths

Will provide net increase of 400,000 tons of ingot capacity after high-cost obsolete furnaces are abandoned. Project, costing $70 million, to be completed in 1951

FOUR hundred thousand tons of ingot capacity will be added to Jones & Laughlin Steel Corp.'s Pittsburgh Works by construction of six new oil-fired open hearths. The new furnaces will have an annual capacity of 780,000 tons, but will replace 10 small, obsolete units which in 1947 produced about 380,000 tons of ingots.

The project, with necessary corollary and finishing facilities, will cost $70 million. It is scheduled for completion in 1951.

No new blast furnaces are being contemplated, although some existing units have been or will be enlarged during relining periods. Additional blowing capacity and improved raw materials will result in more iron production.

Additional Finishing Capacity — The extra ingots can be put through the existing blooming mills at Pittsburgh with a relative small investment for soaking pit capacity. Upon the rebuilding of the slab heating furnaces at company's present 96-inch hot strip-sheet mill, which is now under way, the additional tonnage can all be rolled on this mill.

Hot-rolled coils from the strip-sheet mill will be used to increase production of cold-rolled sheets and tin plate. Sufficient cold-reducing capacity is now available for substantial increases in these products and finishing facilities will be extended in both departments. Equipment to be installed will include a new electrolytic tin plate line and a 2-stand temper mill, plus annealing and handling equipment.

Will Use More Scrap — For many years, J & L has relied heavily on bessemer and duplex steelmaking practices. These account for about 50 per cent of output at Pittsburgh. Completion of the modern open hearths will permit the company to lean more heavily on scrap and hot metal practice. Company believes this will be an advantage in periods of lessened demand, when scrap is cheaper, and that the company's flexibility will be increased substantially.

When the six new open hearths are completed, the Pittsburgh plant's ingot capacity will be rated at 2,537,500 tons, not counting the 380,000 tons represented by the 10 obsolete furnaces. At its Otis Works in Cleveland, where a new 175-ton open hearth recently was installed, ingot capacity is 915,000 tons. Aliquippa has 1,764,000 tons.

Blast furnace capacity is 1,872,000 tons at Pittsburgh, 1,800,000 tons at Aliquippa, and 552,000 at Otis.

McLouth Doubles Capacity

Detroit producer's $18.5 million program will result in complete plant integration

DETAILS of the expansion being undertaken by McLouth Steel Corp., Detroit, producer of strip steel in carbon and stainless grades, and first disclosed in STEEL, July 19, p. 76, reveal the project will more than double present capacity and will result in complete integration of facilities so that it will no longer be necessary to depend upon larger steel companies for hot-rolled products.

Integrated Mill—The program, involving expenditure of $18.5 million, includes a fully integrated steel mill located at Trenton, Mich. Electric furnaces, soaking pits, blooming mill, 42-inch hot mill and cold finishing facilities will be installed. The company recently purchased from the WAA an electric furnace ingot plant built for the government at Indiana Harbor, Ind., during the latter stages of the war and now being dismantled and moved to Trenton. The melting capacity of this plant which had two electric furnaces is being more than doubled by construction of two additional furnaces and related facilities so that eventually there will be four 60-ton electrics in operation with a combined capacity of about 30,000 tons of carbon steel ingots per month. Melting operations in the first two furnaces will commence in January, with ingots rolled elsewhere until the soaking pits and rolling mills have been installed, around July, 1949. The third and fourth electrics should be operating by March.

Last June McLouth completed repayment of a ten-year term loan se-

SHEARING COILS: Flat steel is cut into sheets at a rate of 300 feet per minute at this shear line, one of several in the new sheet and tin plate mill at the Pittsburg, Calif., plant of Columbia Steel Co., a U. S. Steel Corp. subsidiary. Here one operator manipulates control levers while another stands at the side trimming station

cured in October, 1945, to finance an expansion of stainless steel rolling facilities at the present location in Detroit. These will remain in operation at this site. RFC will loan $10.5 million to McLouth to finance the new program; the remaining $8 million will be loaned by interested customers.

Negotiations are under way with scrap sources which appear to insure an adequate supply of raw material for the electric furnaces. Utilization of local scrap from the production of finished steel to be sold in the Detroit area will provide substantial freight advantages over larger mills located outside the area, both with respect to freight on raw materials for steel manufacture and freight on the finished product.

Fisher Moves Into Pittsburgh

APPARENTLY convinced that F.O.B. mill pricing on steel is here to stay for some time, Fisher Body Division of GM has disclosed plans for two new plants in the Pittsburgh area, where they will be handy to mill sources for flat-rolled steel.

Fisher Body has been toying with the idea of a blanking plant located "at the back door" of a steel mill for some time, and soaring freight rates plus the change in steel pricing methods were all it took to activate the thinking.

A war surplus plant at Ambridge, Pa., has been leased from the Navy for one unit, while a site for construction of a new stamping plant has been acquired southeast of Pittsburgh in Mifflin Township. The Ambridge installation will be a blanking plant for cutting sheet or coiled steel to approximate size for subsequent stamping operations. The new stamping plant will fabricate body parts for various assembly units throughout the country.

Production at the Ambridge plant, which was used by American Bridge Co. during the war for ship construction, is expected to get underway within about 60 days. Construction work on the stamping facility will begin immediately with completion date set for late next year. The plant will comprise about 600,000 sq ft, with operations all on one floor.

Oil Men Buy Sharon Tube Unit

TUBE Mill Division of Detroit Tube & Steel Co. is being acquired by Glenn McCarthy, Houston, Tex., oil man, and International Rolling Mill Products Co., Chicago. Detroit Tube, Dearborn, Mich., is a wholly-owned subsidiary of Sharon Steel Corp., Sharon, Pa.

Sharon officials disclosed that negotiations for the sale have been concluded and that only "final arrangements" remain before the tube mill division is turned over to Mr. McCarthy and his associates, probably late this month. The purchase price was not revealed.

The tube mill division of Detroit Tube & Steel has a monthly capacity of between 2500 and 3000 tons of seamless tubing ranging in size from ¼ in. to 5½ in. It is expected that a part of this output will be used by Mr. McCarthy for his oil company operations. Sharon Steel, it is understood, will provide the semifinished material for the tube mill's operations.

Mill was acquired by Sharon in 1945 and became the Detroit Seamless Tube Co. In 1947 this firm was merged with Bopp Steel Corp., another Sharon subsidiary, to form Detroit Tube & Steel. Sharon's strip steel division of Detroit Tube & Steel is not involved in the sale.

Steel Producers' Earning Ability Strengthens During Third Quarter

REFLECTING improved earning ability, 16 steel producers representing more than 81 per cent of the nation's ingot capacity rose 30 per cent over that of the second quarter. Compared with the third quarter of last year, the 1948 third quarter aggregate was up 54 per cent.

The improved performance in 1948's third quarter helped put the total net earnings in the first nine months 13 per cent over the total for the first nine months of last year.

Third-quarter earnings of the 16 companies aggregated $119,912,709, compared with $91,987,747 in second quarter, and $77,653,530 in 1947's third quarter. During the first nine months of 1948, net income totaled $293,784,912, compared with $259,488,739 in the like period of last year.

Although aggregate net earnings of the 16 companies rose in the third quarter over second quarter, three showed decreases. However, all third quarter earnings this year were higher than for the same period in 1947.

Because of the steep rise in costs of new plant and equipment, a number of the steel producers set aside increased amounts for wear and exhaustion of facilities. The problem of determining the proper amount of additional cost to cover such losses as reduction in dollar purchasing power, economic obsolescence, and abnormally excessive present-day costs is being intensively studied by the steel industry.

	Third Qtr. 1948	Second Qtr. 1948	Third Qtr. 1947	First 9 Mos. 1948	First 9 Mos. 1947
United States Steel Corp.	$34,599,132	$32,585,677	$28,735,082	$88,042,150	$97,306,461
Bethlehem Steel Corp.	22,584,752	15,099,775	10,211,336	53,183,858	38,710,728
Republic Steel Corp.	12,874,398	7,805,410	6,380,016	29,812,788	23,111,631
Jones & Laughlin Steel Corp.	8,757,416	6,341,197	4,979,482	20,249,317	16,682,738
National Steel Corp.	11,175,400	7,364,275	6,802,840	27,201,435	19,903,655
Inland Steel Co.	9,811,133	6,549,849	7,670,295	24,819,526	21,791,583
Armco Steel Corp.	8,347,966	6,157,055	5,934,418	20,372,369	18,165,398
Wheeling Steel Corp.	3,866,913	3,043,475	2,640,189	9,691,645	8,430,261
Crucible Steel Co. of America	989,754	633,757	23,639	2,191,297	1,097,262
Colorado Fuel & Iron Corp.	2,425,660	1,801,532	1,397,904	5,676,423	3,826,459
Continental Steel Corp.	407,838	406,254	357,036	1,027,509	998,490
Keystone Steel & Wire Co.	860,238	1,016,739	816,456	3,245,201	3,562,876
Rotary Electric Steel Co.	741,303	530,059	145,475	1,689,656	546,588
Carpenter Steel Co.	522,508	531,668	250,631	1,483,870	1,223,075
Portsmouth Steel Corp.	1,107,101	904,915	907,451	3,040,561	2,941,131
Barium Steel Corp.	841,197	1,216,110	401,280	2,057,307	1,190,403
Totals	$119,912,709	$91,987,747	$77,653,530	$293,784,912	$259,488,739

Freight Car Orders Drop

High prices, fewer loadings blamed. Builders still have year's backlog

NEW ORDERS for railroad freight cars have fallen off sharply, and, surprisingly, right while the need for cars was deemed critical enough that the car building industry is being favored with the largest of all current voluntary steel allocations programs. In fact, this program is allotted half of all the steel being allocated.

Does this mean railroads feel they don't need more cars than they already have on order? Or that the price of railroad cars is getting too high? Or that the railroads don't want to place orders now for cars that probably can't be delivered before a year from now? Does it mean the carbuilders will ease their demands for steel, thus making more tonnage available to other consumers?

Spokesmen at the American Railway Car Institute, New York, and at the Association of American Railroads, Washington, expressed surprise and concern over the sudden drop in freight car ordering. However, the most positive in their explanations of the occurrence were railroad officials who said they consider car prices too high, and cited as example the recent rejection by one road of bids on 500 cars because it was felt the prices were excessive.

Carloadings Down—In becoming increasingly price conscious, railroad officials admit they are being influenced to some extent also by the fact railroad carloadings in the past several weeks have been around 40,000 cars per week below those of this time last year. And yet industrial production now is at new postwar peaks. On the other hand, volume of freight transported by motor carriers in August increased 18.9 per cent over August, 1947.

In analyzing the truck vs. railroad business trend, railroads can't help but take into consideration the substantial increases in rail freight rates and the recent adoption by several important industries of mill pricing, which tends to shorten hauls, thus giving additional advantage to truck lines.

Whatever the reasons for the plunge in car orders, the fact remains the total of 845 cars ordered in September is in sharp contrast with any month since June, 1945. Freight cars ordered each month since 1943 are totaled in the following table:

	1948	1947	1946	1945	1944
Jan.	9,213	9,172	1,481	7,200	1,020
Feb.	10,698	13,727	2,328	1,750	13,240
Mar.	13,427	12,049	3,512	2,500	6,510
Apr.	18,252	9,296	3,564	1,120	4,519
May	2,230	7,389	2,900	1,526	1,952
June	5,873	12,784	3,335	670	1,150
July	11,923	14,840	14,836	3,500	795
Aug.	3,739	2,372	9,527	7,240	3,900
Sept.	845	9,917	11,102	12,840	400
Oct.	....	17,737	3,407	1,320	2,425
Nov.	....	8,169	6,690	1,650	1,065
Dec.	....	4,218	3,441	4,116	16,245
Total	....	121,707	66,723	45,432	53,221

Year's Backlog—As of Oct. 1, 1948, all railroads and private carlines had 108,996 new freight cars on order, according to the Association of American Railroads. During September, 9753 new cars were delivered.

The leading factor in allocations programs, freight car builders are allotted 246,000 tons of steel a month.

Aluminum Co-operative?

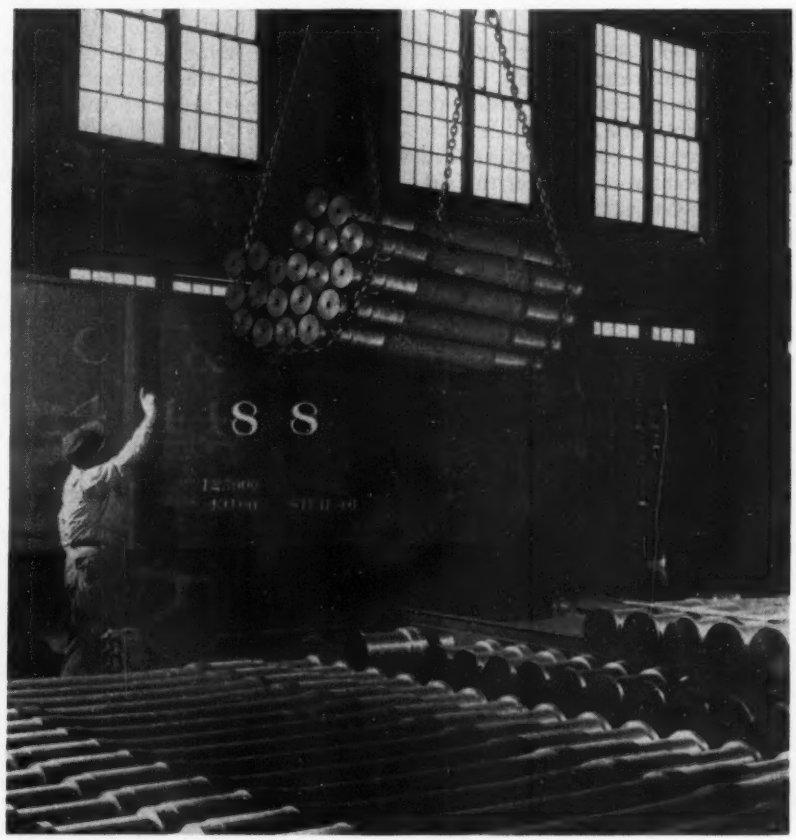
Nonferrous foundry group plans formation of a co-operative to operate a reduction plant

FORMATION of a co-operative to buy and operate an aluminum reduction plant is planned by a group of nonferrous foundries. Decision to insure supplies by producing their own aluminum ingot was made Oct. 22 at a meeting in Philadelphia of members of the Non-Ferrous Founders' Society. The association has a membership of over 300.

The foundries will bid on two government-owned aluminum plants for sale or lease at Massena, N. Y., and Riverbank, Calif. While details for financing this undertaking have not been announced, it is understood that each foundry would assume financial responsibility in direct proportion to his aluminum ingot requirements.

Action a Necessity—In announcing the decision, society members pointed out that such action is a necessity because primary producers of aluminum ingot find it more profitable to fabricate their own products than to sell to independent foundries for castings. The shortage of primary aluminum ingot, which has steadily worsened since the war's end, and the high price of secondary ingot constitute serious problems for the independents.

This step parallels plans contemplated, but not yet acted upon, by ferrous foundries which were motivated by the lease of the government



Destined for new freight cars are axles from the Gary, Ind., Works of Carnegie-Illinois Steel Corp. But will need for them and other steel products be lessened by a reduced demand for cars, thereby leaving more steel available for other consumers? That question has arisen with a sudden drop in freight car ordering

blast furnace at Cleveland to Kaiser-Frazer Corp. In the steel industry a postwar co-operative action was inaugurated when a syndicate of 25 manufacturers organized the Phoenix-Apollo Co. which purchased the Apollo Steel Co., Apollo, Pa., and Phoenix Iron Co.'s steelworks at Phoenixville, Pa., including the latter's subsidiary, Phoenix Bridge Co.

Louis Fischer, Plainfield, N. J., is chairman of the Non-Ferrous Founders' Society's committee formed to carry on negotiations. Newly elected officers of the society are: President, Fred Haack Jr., president, Capital Brass & Aluminum Foundry Co., Chicago; first vice president, Walter M. Clark, president, D. W. Clark & Co., Boston; second vice president, J. D. Zaiser, president, Ampco Metal Inc., Milwaukee.

Gear Backlogs Melt

Gearmakers, at semiannual meeting in Chicago, hear operations continue fairly good

ALTHOUGH gear industry operations hold at fairly satisfactory levels, the previously heavy backlog is melting away at such an ominous rate that drives for increased sales and greater plant efficiency should be inaugurated before it is too late.

This was the advice of W. L. Schneider, vice president, Falk Corp., Milwaukee, and president, American Gear Manufacturers Association, who made the opening address before last week's semiannual meeting of the association in Chicago.

Profit Relatively Low—He pointed out that an average profit throughout the industry of 7 per cent after taxes cannot be considered as excessive or even as particularly safe when it is borne in mind how much standby equipment is required. Mr. Schneider emphasized that in many cases the down time on machine tools is too great, and he hailed the studies now under way to promote more effective use of manufacturing equipment and to arrive at a clearer understanding of real manufacturing costs.

Gaining particularly wide attention was the paper by John F. Swift, Ford Motor Co., on hydrodynamic transmissions. These mechanisms, very much in evidence in automobile design and gaining a foothold in other types of machinery demanding flexibility of drive and speed changes, not only are competing with gear sales, but also are requiring new manufacturing techniques from gearmakers in that special gears in some cases are used in connection with fluid couplings or torque converters.

Techniques Change—In other technical sessions, it was brought out that the defense program is calling for new or changing techniques of manufacture, particularly in grinding and shaving. Shaving is now being applied to unusually small and exceptionally large gears. There is growing need for shaving tools designed to handle such work. This requirement will be intensified as the defense program develops. D. W. Dudley, General Electric Co., dealt with new developments in grinding highly stressed, high precision aircraft gears.

In addition to other technical papers, many general subjects were discussed by A. G. Bryant, past president, National Machine Tool Builders' Association; Henry Fowler, chief counsel for the United States Chamber of Commerce; and Carl Taylor, president of Waukesha State Bank, Waukesha, Wis.

Packaging Men Stress Costs

BOGEY of rising costs hits the maker of packaging machinery from two directions, according to George W. von Hofe, president, New Jersey Machine Corp., who spoke before the recent annual meeting of the Packaging Machinery Institute in New York.

Not only are development costs soaring, he said, but costs of producing the machine have jumped, with the result that buyers must pay a much higher price for the finished product. He estimated that the cost of developing a machine so that it will produce 100 per cent more is often about four times the cost of the original equipment.

Mr. von Hofe, retiring president of the institute, was succeeded in that office by H. Kirk Becker, president of Peters Machinery Co., Chicago. E. G. Kuhn, president of Consolidated Packaging Machinery Corp., Buffalo, was elected a vice president.

Defense Activity Reflected

IMPACT of military orders under the current defense program is reverberating in Washington state. Sen. Harry P. Cain states $400 million will be expended at the Hanford works during the coming year, averaging in excess of $20 million monthly.

By the end of 1948, Boeing Airplane Co. plans to reach a local employment level of 19,000. During the strike, Boeing adopted a plan of farming out subcontracts to maintain an employment level of 11,000 in Seattle. This policy is being continued.

The company has taken over a portion of the Renton plant which it used during the war.

Congress To Study F.O.B.

Senator Capehart will probably introduce pricing legislation. Action may come by May

LEGISLATION clarifying the legal muddle over the pricing situation will probably be introduced in the next session of Congress by Sen. Homer E. Capehart (Rep. Ind.), chairman of the Senate Trade Policies Committee. Action on the matter should come by May or June, says the senator.

With f.o.b. the only method specifically designated as legal, the negative, hazy status in pricing is intolerable, he declared at a recent press conference in Chicago following a meeting of his committee's 47-man advisory council. The senator, however, repeated his advice, which has also been given by Secretary of Commerce Charles Sawyer, that business make no drastic change in pricing policies until Congress has had an opportunity to study the problem.

Protests Mount—Senator Capehart revealed that letters received by his committee are in the ratio of 497 to 3 against f.o.b. pricing. Most vehement are complaints from within the cement industry where some contractors have been forced out of operation because of excessive costs of material when freight from distant points is added.

Allocation Extension Approved

EXTENSION of voluntary allocation programs for six months after Public Law 395 expires Feb. 28 has been approved provisionally by the Department of Justice. This means that the seven civilian programs can be continued through next September, if the steel industry approves and the Department of Commerce certifies such extensions are in the public interest.

Letters have been sent by the Commerce Department to members of the Steel Industry Advisory Committee calling them to a meeting in Washington soon to consider extension of the seven civilian programs. These include freight cars, warm air heating, oil field and production equipment, barges, prefab housing, anthracite coal and tankers. Military programs, including the armed services, atomic energy, and National Advisory Committee for Aeronautics, are assured of steel.

Four postponed programs covering bituminous coal, East Tennessee pipeline, mining machinery and terminal oil storage tanks also will be considered at the steel industry meeting.

Industry Speaks

METALWORKING executives favor Dewey over Truman for President by a 3½ to 1 margin. A surprising number of them favor f.o.b. mill pricing for steel products. Most of them want more steel.

These were the results indicated in STEEL's poll at the Metal Show at Philadelphia where visitors were invited to express their preferences on a battery of automatic voting machines. Poll results as of Thursday noon:

Presidential Preference:

Dewey	754
Truman	215
Wallace	36

Steel Pricing: *Question,* "Do You Favor the New F.O.B. Mill Pricing System on Steel Products?"

Yes	401
No	442

[Polls on f.o.b. mill vs. basing point pricing show wide variations of opinion, depending on who is polled and how the question is worded. See page 52.]

Steel Supply: *Question,* "Has Your Production Been Curtailed During 1948 Because of Lack of Steel?"

Yes	613
No	225

Theme of 30th annual Metal Congress and National Metal Exposition—"A Salute to Alloy Steel"—was portrayed in this dioramic mural erected on stage of main arena

Metalworkers Salute Alloy Steels

Thirtieth National Metal Congress and Exposition dramatizes development and use of alloys over 75 years. Industry shows latest technical progress

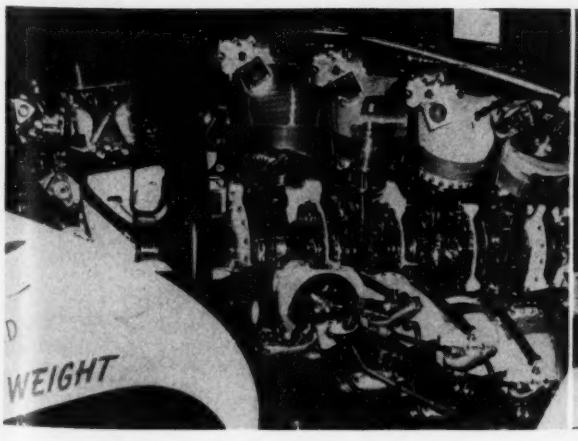
PROGRESS in developing and using alloy steels during the past 75 years was strikingly demonstrated at the 30th annual metal exposition at Convention Hall in Philadelphia last week. Strides made were evident in the mechanical parts utilized by the steel, railroad, electrical, machine tool, automotive, oil well, agricultural, shipbuilding and many other industries.

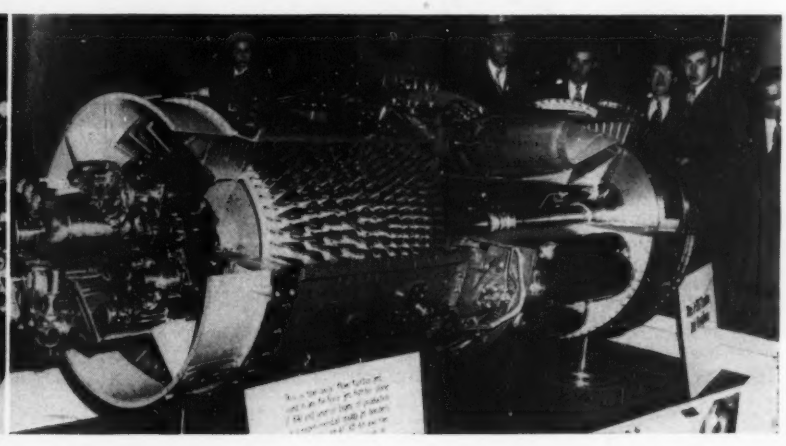
In a special exhibit to which all the above industries, and the armed forces, contributed, alloy steel parts appeared to be the rule rather than the exception. They were evident as oil well drilling components, automotive and aircraft units, and in farm and railroad equipment. Of some 11,714 tons of steel going into a heavy cruiser, for example, the Navy reports 3840 tons consist of alloy steels.

About 340 companies from the Unit-

Show goers were intrigued with this cut-away model of Pratt & Whitney Wasp aircraft engine, left below, which weighs 3482 pounds, develops 3500-hp and requires 5000 pounds of alloy steels in its manufacture

Allison GM axial flow turbo jet engine used in F-84 air force fighters, right below. Requiring a great amount of high temperature alloys in its construction, this unit at 570-mph develops the equivalent of 6080-hp





Meehanite crankshaft cast by Cooper-Bessemer for one of their diesel engines is being inspected by E. W. Flaherty and Wallace Sweeten, Ford Motor officials. This unit weighs three tons

ed States and Canada participated in the exposition, sponsored by the American Society for Metals. Other societies joining ASM in the "Salute-to-Alloy-Steel" celebration were the American Welding Society, Metals Division of the American Institute of Mining and Metallurgical Engineers and the Society for Non-Destructive Testing.

Exploiting Powdered Metals—Visitors at the show, which covered practically all phases of metals production and fabrication, gained several distinct impressions. One was that many companies are further exploiting the possibilities of powdered metals. New Jersey Zinc, for example, is producing limited quantities of small hard-to-machine-products of powdered brass.

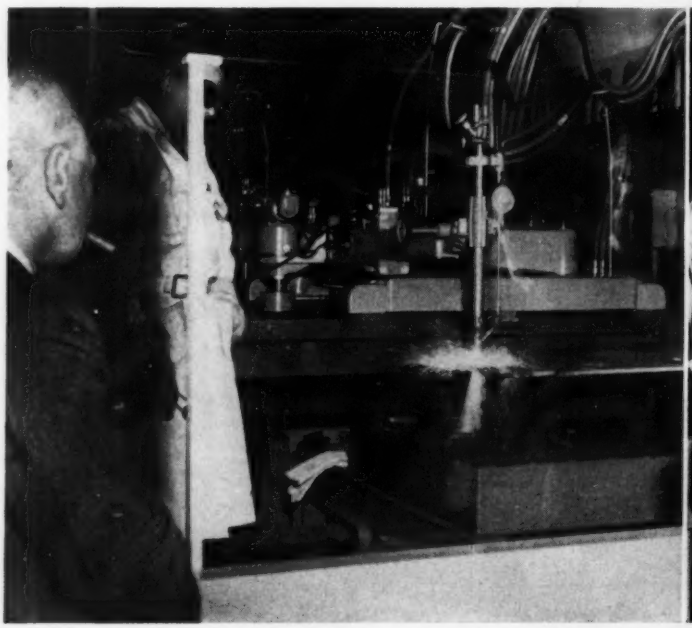
Another impression was the utilitarian use of standardized equipment for specialized jobs. A 100-lb work positioner with variable speed drive, exhibited by Ransome Machinery Co., not only can be used for welding, but also for hard surfacing, assembling, repairing and grinding.

Service industries such as the cutting oil and lubricant producers have kept apace with and even made

Nickel plating of "good luck" tokens for show visitors, above, is being performed by this one-sixth scale model of one of the full automatic commercial installations of Hanson-Van Winkle-Munning Co.

Demonstration of Linde powder cutting and scarfing equipment, left below, interests visitors who are concerned with cutting stainless and other oxidation-resistant materials

Selas Corp. of America displayed a model of one of their installations using gradiation gas fired units for the continuous heating of bar stock for forging or other hot forming operations, right below



possible some of the advancements reflected by the show. One oil company not only supplies oils, but also provides its customers with a self-developed and manufactured instrument that provides an accurate, reliable means for combustion control.

New Welding Development — New developments were shown by many companies. One of the newest was an "aircomatic" process for welding heavy sections of aluminum and aluminum alloy at wire feed speeds of 100 to 300 inches per minute. It is said to make available for the first time automatic welding in a hand tool. Developed by Air Reduction Sales Co., the process is essentially a form of gas shielded, metal arc welding with the non-consumable electrode being replaced by a continuously-fed consumable wire.

American Cladmetals Co. introduced a new stainless-clad copper metal which promises to find wide application. It already is being used in commercial products where swift heat or chill conductivity is desired. The copper case is joined to the stainless surfaces permanently by a molecular bond in a process owned and developed by this company.

A liquid blast cleaning method, which improves surface finish and is capable of holding tolerances to 0.0001-inch, was shown and demonstrated for the first time by Pangborn Corp., Hagerstown, Md. The process is a modified form of impact blasting using an abrasive suspended in a liquid which is delivered to the blasting nozzle by a circulating pump. Velocity is imparted to the suspension as it flows through the blasting nozzle by injection of compressed air. By virtue of the fact that the abrasive particles are suspended in a liquid, there is said to be no limit to the fineness of the particle which may be used.

High Speed Inspection—Complete inspection of parts in one operation is the feature of new magnetic testing procedure developed by Magnaflux Corp., Chicago. Two electric currents are applied at the same time to produce a swinging field magnetization. When the bath is applied, the swinging field cuts across all possible defects at right angles, as required for best formation of magnetic particles into the easily-seen indications of the defects. The procedure is most effective for smaller parts in cylindrical or bar shape. Bolts, wrist pins, roller bearings, small gears, camshafts, and the like, can be inspected in high volume.

Speeds as fast as 700 die casting cycles per hour are said to be possible with automatic timing on a new machine introduced by Kux Machine Co., Chicago. Movement of one pushbutton puts the machine through a complete die casting cycle, with each phase of the cycle electrically timed. Machine is air operated. Die opening and closing, and action of the metal injection plunger holding the metal under pressure in the die, can be timed to suit operating conditions, and, once set, every cycle is the same.

Several new products were introduced by P. R. Mallory & Co. Inc., Indianapolis. One was a fluted resistance welding electrode designed to provide a 70 per cent increase in cooling. Another was an offset electrode with improved cooling, and a third was a new design in electrode holders.

Riverside Metal Co., Riverside, N. J., has developed a new Grade "A" phosphor bronze wire with tensile strength 10,000 pounds over established standards.

Lepel High Frequency Laboratories, New York, introduced for the first time at the show a completely redesigned line of high frequency heating units of all-steel construction.

Flamatic selective surface hardening machine was exhibited by Cincinnati Milling Machine Co. Operator is hardening a primary take-off drive shaft made of SAE 4140 steel

Society for Metals

THIS year several attractions added spice to the week-long activities of the American Society for Metals which took place both in the Benjamin Franklin Hotel and Philadelphia's Convention Hall.

First of these was the seminar on cold working of metals, opening event in the series of technical sessions. Other events included educational lectures on properties of metals in materials engineering, and grain growth in industrial metallurgy; the third metallographic exhibit sponsored by the society; a round-table discussion meeting on metallurgical literature classification and filing with particular reference to punch-card methods; a Canadian get-together in which ASM chapters from Montreal, Ontario, British Columbia, Manitoba, Ottawa Valley and Western Ontario participated; and a special event in which distinguished service awards were presented as part of the organization's salute to alloy steel celebration.

Forty-four papers were presented at the regular technical sessions of the society during the week. Bulk of those presented on Monday were concerned with heat treating. Other subjects discussed during the remainder of the week included steel ingots, nonferrous alloys, mechanical and engineering properties, stainless steels, high-temperature alloys, physics of metals and testing.

Harold K. Work, manager of research and development, Jones & Laughlin Steel Corp., Pittsburgh, is the newly-elected president of ASM, succeeding Francis B. Foley, superintendent of research, Midvale Co., Nicetown, Pa. Arthur E. Focke, chief metallurgist, Diamond Chain Co. Inc., Indianapolis, was elected vice president, and William H. Eisenman was re-elected secretary for his 16th consecutive 2-year term.

Besides the above officers, the board of trustees for 1949 include E.

(*Please turn to Page* 112)

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

Tax policies would be clarified and established permanently for peacetime under two bills to be introduced early to 81st Congress. Total tax burden would not change much

TWO TAX BILLS are in preparation by the Ways & Means Committee for introduction in the House soon after convening of the 81st Congress Jan. 3. One will be a general tax revision measure along the lines of the bill approved by the House in 1948 too late for action by the Senate. The other will be an excise tax bill. They will not raise or lower the present total tax burden appreciably. Rather, they are aimed at clarifying and establishing permanent peacetime tax policies.

Incidentally, the Senate Republican leadership, firmly confident that the elections will renew its majority in the coming session, has asked the Ways and Means Committee to hasten House action so as to get the two measures in the hands of the Senate Finance Committee no later than the middle of February. Prospects are that the two House bills will be passed no matter which party has control of the Senate.

Of the two bills, the excise tax bill is the one that probably will attract most interest. This is because of the local considerations involved. At the present time there are some 52 excise taxes on the federal statute books. Among them are many which were imposed long before World War II, such as the taxes on liquor, tobacco, admissions, automobiles, mechanical refrigerators, etc. Other taxes were imposed during the war period and in most cases the rates of all the excise taxes were substantially increased.

Agree on Principle—There is rough agreement on the principle involved; that is that a broad excise tax system should be retained. The yield from the 52 excise taxes has been in the neighborhood of $7.5 billion annually, and congressmen generally are agreed that there should be no substantial reduction here. This is because of the unstable character of the income tax collections. In times of active business the government collects large revenue from the income tax. In a severe depression, when the incomes of many citizens vanish, income tax collections suffer.

Of course, there are many local and industry considerations in the excise tax setup. The silverware industry will want more favorable excise tax treatment than it now is getting. The tobacco, liquor, beer and wine industries think they are being treated unjustly. So there is no way of predicting just what the final excise tax pattern will be. All affected industries should keep in close touch with the Ways & Means Committee and be prepared to state their viewpoints when opportunity is offered next year.

To Refine Old Bill—The general tax revision bill to be offered next January will be largely the 1948 bill plus a few refinements worked up by Colin Stam's Joint Committee on Internal Revenue Taxation. The 1948 bill provided for approximately 80 changes in the Internal Revenue Code. Their purpose was to correct tax inequities and further the administration of the tax laws. The main changes, which again will be in the 1949 bill, provide:

A 5-year carry-forward and a 1-year carry-back to replace the 2-year carry-forward and 2-year carry-back allowed under existing laws. Continuance of the net operating loss used in the carry-over is redefined in order to eliminate the current discrimination against those businesses with fluctuating incomes.

The same review of Tax Court decisions by the Appellate Courts as now is given over United States District Court decisions arrived at in cases tried without a jury.

More favorable tax treatment of employees purchasing stock from their employing corporations, in order to encourage use of stock-buying plans as incentives to employees.

Less onerous provisions governing the penalty tax on excess accumulations of capital by corporations, and giving corporations 75 days following the close of the taxable year to declare dividends that may be deducted.

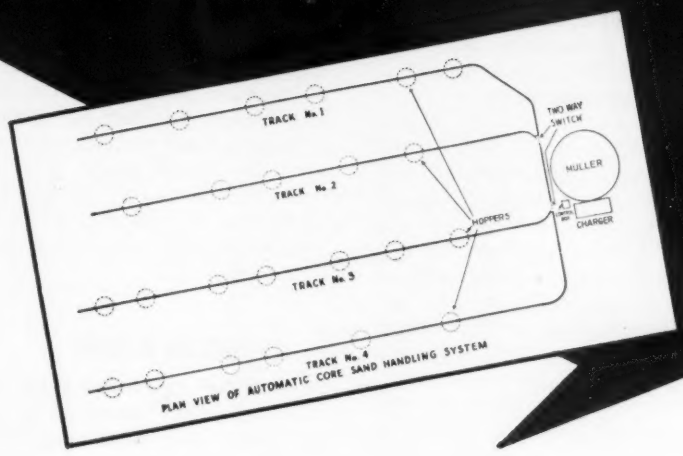
Elimination of the "premium payment" test as a determinative basis for including insurance on a decedent's life payable to specific beneficiaries.

A specific definition of tests to determine the position of related part-

HEADING FOR SENATE? Proposal by Sen. Owen Brewster (Rep., Me.) making former presidents honorary senators for life has drawn approving comment from leading Republicans and Democrats alike. Sen. Robert Taft (Rep., O.) suggests former presidents be given nonvoting seats in the Senate at $25,000 a year. If the plan should be adopted, Herbert Hoover, right, would immediately become eligible. President Truman would qualify after Jan. 20 if Thomas E. Dewey takes over the White House. NEA photo

Automatic Dispatch System

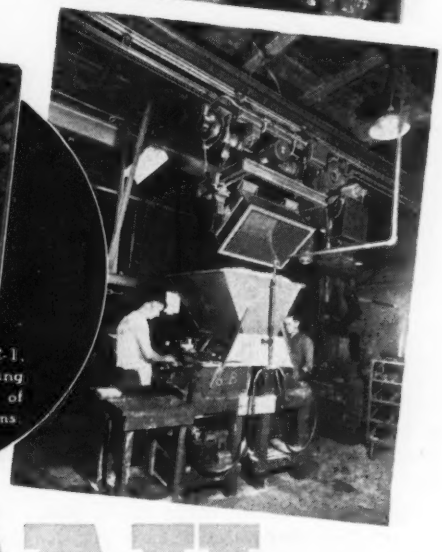
delivers 25 tons of core sand per day!



PLAN VIEW OF AUTOMATIC CORE SAND HANDLING SYSTEM

This compact system requires only two men to keep 24 core benches supplied with fresh core sand. Charger receives sand from underground conveyor. Sand is loaded and automatically dispatched and dumped to any one of 24 stations, on four tracks, by push button control. Track switches are manually operated. Each track can be increased to 16 stations or 64 in all. This is another of the hundreds of American MonoRail installations that have cut handling costs. Let an American MonoRail engineer show you how it can be done in your business.

SEND FOR BULLETIN C-1, a 56-page book showing successful applications of American MonoRail Systems



THE AMERICAN MONORAIL COMPANY

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ners in a family partnership for federal income tax purposes.

If a corporation sells its assets just prior to liquidation, the existing gain or loss provisions will not apply if the sale is made within 12 months preceding the distribution to stockholders and is based on a plan previously reported to the Commissioner of Internal Revenue.

Exemption from the federal estate tax of payments to surviving beneficiaries under pension and profit-sharing plans.

Unification Meets Resistance

UNIFICATION of the armed services, despite provisions of the National Security Act of 1947, has not been achieved under the surface, and much work is ahead of the House and Senate Armed Services Committees to determine where the trouble is and how it can be remedied. The big battle, raging in intensified form behind the scenes, is over the two separate air commands; the Air Force continues determined to take over the Navy's aviation, and the Navy is just as set on maintaining its separate status.

As far as industry is concerned, the most confused situation is that involving procurement. Each service insists on doing much of its own procurement, and that also goes for bureaus and departments in each service. The Army quartermaster general's office thinks it ought to procure a lot of supplies now bought by the Navy and Air Force. Particularly irksome to the quartermaster general is the insistence of many specialists, particularly scientific workers, on buying their instruments and other equipment.

Could Mobilize in Few Days

PLANNING activities of the National Security Resources Board have advanced to the stage where it would be but a matter of a few days to set up in Washington a complete organization to direct and handle total mobilization in the event of a war emergency.

In the absence of an emergency, the board continues to move in orderly fashion to the freezing of its first total mobilization plan. This will be set up in the form of a series of blueprints before the end of the year. The plan is to be known as the "Mobilization Plan of 1949."

Whether it will be made public has not yet been determined. However, it is not to be kept under cover to the extent of discouraging necessary cooperation. Substantially all the industries and other entities that are involved already know, from conferences that have been held, where they stand under the plan and what kind of co-operation will be expected of them in case the plan has to be put into effect.

In the meantime, the NSRB continues to appoint additional industry division chiefs in its Office of Production—which in the event of another war would be the successor to the War Producton Board of World War II. The idea is to get all the top spots manned now.

Production Director George E. Felton has appointed three assistant directors, Leighton Peebles in charge of manufacturing, Gayle Arnold in charge of industrial services, and Arthur E. Carpenter in charge of raw materials. Mr. Arnold is top man on problems of locating industry.

New division heads in the Office of Production are: Transportation equipment, G. H. Froebel; farm machinery, W. J. Fisher; construction and mining machinery, Everett Wilcox; shipbuilding, W. T. Riley; ordnance, Maj. Gen. Charles T. Harris Jr.; safety and technical equipment, H. A. Pringle; consumers durable goods, Frank Higgins; food, F. Chapin Weed; nonmetallic minerals, F. Rockwell; petroleum, Col. Augustus Vogel.

Inquire Into Allocations

WHEN the Commerce Department held its public hearing Oct. 21 on the proposed steel allocation program for passenger, cargo and combination vessels, no opposition was expressed by any of the interested parties. The main interest was in the question as to what authority could be invoked to procure steel for vessels not yet ordered. The answer: The only authority, as far as the Commerce Department has been able to gather from the Justice Department, is under Public Law 395—and this is due to expire Feb. 28, so that unless it is extended by Congress there will be no authority to allocate steel for shipbuilding for shipment after February. The shipbuilders who raised the question had in mind the proposed 48,000-ton superliner on which United States Lines is to open bids Dec. 1.

The program aired on Oct. 21 calls for 10,190 tons of steel monthly in January and February to go into these categories: 6527 into five new ships, 862 tons into alterations in 28 existing ships, and 2801 into repairs on a large number of ships.

Steel Reports Delayed

NOT ALL steel producers yet have furnished the steel distribution statistics requested by the Senate Small Business Committee in a questionnaire sent out in September. This includes some of the larger interests who are being delayed in making their tabulations. As a result the committee staff has been unable to freeze a schedule for studying the figures and reaching conclusions with respect to problems in the field of steel distribution.

Hearing on Furnace Sale Set

NOV. 8 has been chosen as the date for further hearing on Capitol Hill in reference to disposal of the government's blast furnace at Cleveland to Kaiser-Frazer Corp. The hearing will be conducted by the Bender subcommittee of the House Committee on Expenditures in the Executive Departments.

To Report on Britain

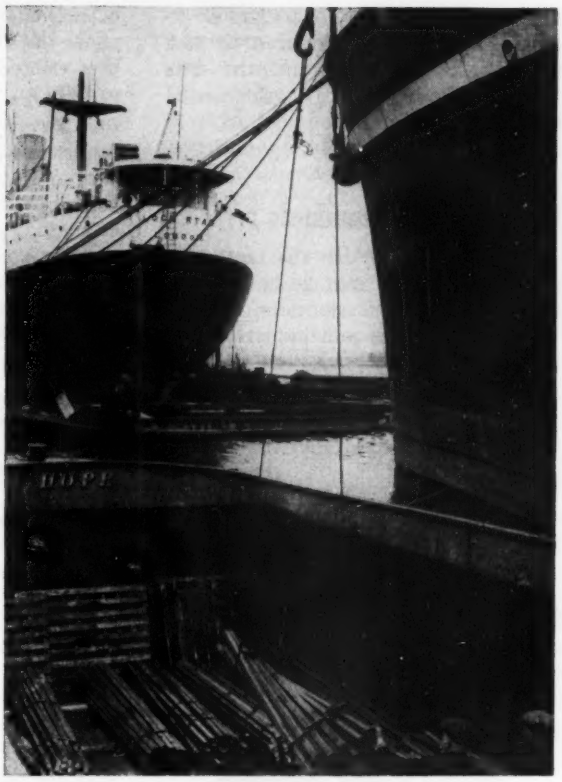
THE NEW Anglo-American Council on Productivity seems to be getting off to a good start. Reports from London state that some individual British companies have increased their man-hour productivity by 20 to 30 per cent and even more in some cases. Details as to how these improvements are being attained are lacking, but it is understood pay incentive systems are playing their part.

Detailed reports are expected later from two Bureau of Labor Statistics productivity experts who are in the American representation on the council. They are W. Duane Evans, the bureau's top man on productivity, and James M. Silverman, chief of the bureau's Productivity Branch. Their findings eventually will be publicized for benefit of U. S. industry.

Possibly this information will be put out at a time when we can derive great benefit from it, for an opinion widely held in Washington is that the British rapidly are getting their economic house in order.

Brazil Won't Export Steel

CHECKING on reports that Brazilian surplus steel production might shortly be offered for export into the United States, the Brazilian Embassy in Washington has been advised by the Brazilian producer, the National Steel Corp. of Brazil, that no such proposal is under consideration. On the basis of its present capacity, all of which is not yet in operation, the Volta Redonda works is unable to produce enough steel to meet home market requirements, so that imports continue necessary. Brazil's steel quota in the United States export program is 9000 tons of tin plate and 20,000 tons of other steel products per quarter.



Industrial rehabilitation phase of the Marshall Plan gets underway in Britain as a lighter at London, appropriately named Hope, takes on the first shipment of ECA steel. The metal, brought by the freighter Malakand, is destined for the Ford Motor Works at Dagenham. NEA photo

Convalescing Europe Doing Well

Patient is responding to treatments from ECA and other sources as trade and business intercourse revive. Merchant ship construction is increasing

CONVALESCING Western Europe is reacting well to treatments from the Economic Cooperation Administration and other sources as world business intercourse revives and export activities in Britain, Belgium, Bizonal Germany and Sweden increase. Only in France does a rash of strikes and other maladies seriously incapacitate the patient.

Western Europe hopes for results from the therapy prescribed by the Organization for European Economic Cooperation. This body recommends to ECA that the nearly $5 billion be granted from July 1, 1948, to June 30, 1949. Recommended grants, in millions of dollars: Austria 217, Belgium-Luxemburg 250, Denmark 110, Trieste 18, France 989, Bizonal Germany 414, French Zone of Germany 100, Greece 146, Iceland 11, Ireland 79, Italy 601, Netherlands 496, Norway 84, Sweden 47, Turkey 50, United Kingdom 1263. Total aid requested would be $4875 million.

Indicative of trade revival is the report by Lloyd's Register of Shipping that world merchant shipbuilding hit a peacetime peak during the third quarter, with 4,205,714 gross tons under construction, an increase of more than 180,000 tons over the previous quarter. The United States increase of 127,000 tons accounted for most of the rise.

Great Britain

SHIPBUILDING in Great Britain and Ireland lagged slightly during the quarter, with 2,208,000 tons under construction, or 52.5 per cent of the world total, compared with 55.8 per cent in the June quarter.

This decrease is accounted for largely by the fact that steel is being allocated to other British industries, particularly farm equipment and rail freight cars. Midland manufacturers of light tractors are boosting production for the export market, and the overseas demand for British rail cars is unprecedented. In the tin plate trade in South Wales slightly higher export allocations have been made for the last quarter of the year. About one-third of the Welsh tin plate output is being exported now, but the proportion may be boosted to half.

Belgium

BELGIAN steel producers still find that their excellent delivery dates outweigh as a selling point their high prices. In the United States Belgian sheets have sold for twice the prevailing market price.

Demand is now particularly active from South Africa, Egypt and Venezuela. The Pakistan government has ordered 100,000 metric tons of Belgian steel products. Belgium also expects to ship an additional 60,000 tons of steel to Denmark and 250,000 to 300,000 tons to Switzerland.

Plans for steel plant expansion are proceeding, with a sheet mill scheduled to begin operations soon at the works of Experance-Longdoz at Liege. Most factors affecting Belgian output remain surprisingly good. Coal production is steadily improving, and the labor supply is excellent. In fact, the country now has a total industrial unemployment of 80,000, but this results largely from maldistribution. Nevertheless, the Minister of Labor has stopped immigration of Italian workers and displaced persons.

Western Germany

GERMAN and Swedish industrialists are negotiating for construction of a large continuous rolling mill for sheets, probably to be built adjacent to some steel plant like the August Thyssen Huette. The Swedes would put up the capital, $10 to $15 million, which would be repaid by shipment of sheets to Sweden.

Western Germany's export trade is particularly brisk in tubes and pipes and would be as lively in wire, wire products, plates and sheets if the capacity were available. Another source of foreign income for the nation may come from the shipbuilding industry. Hamburg and Bremen shipping interests are striving to get Military Government to lift the ban on ship construction, and prospects are promising that the embargo will be at least partially raised.

October steel output is estimated at about 600,000 tons, above even September's 571,769 tons which was a postwar record.

Sweden

BIZONAL Germany this year is receiving a sharp increase in its share of Swedish iron ore. More than 875,000 tons were shipped to the Ruhr in the first eight months of 1948, compared with 47,000 tons all last year. Sweden has agreed to ship the Reich 3,400,000 tons of ore in 1949 in exchange for 125,000 tons of hot-rolled steel and other products.

Great Britain is the leading importer of the Swedish raw material;

it got 2,198,000 tons during the first eight months. Second place is held by Belgium-Luxemburg, last year's leading importer. Third largest importer is the United States which received 978,000 tons during the first eight months and will probably get about 1,500,000 tons for the year. This is about half the figure which some estimated would be shipped to this country in 1948.

One factor tending to hold down Swedish exports of ore is the steel industry expansion program in the country. Latest project is a new rolling mill for Kanthall Co., Hallstahammar, with an annual capacity of 12,000 tons. Full operations will commence at the beginning of 1949.

France

FRENCH coal strikes, which have resulted in the nation losing more than 3 million tons of coal, have had effects even on France's trade negotiations with Britain. The joint Franco-British Economic Committee, prior to the strikes, had decided on a large-scale exchange of French semifinished steel for British coal, but the agreement has been postponed.

Political and economic instability also accounts partly for a decline in production of machine tools and engineering machinery. A program by French machine tool manufacturers to increase exports is making only slow progress. Most encouraging deal has been made with Czechoslovakia whereby French machine tools, textile machinery and 2000 tons of cast iron pipe and 20,000 tons of iron ore will be exchanged for Czech coke and refractories.

A fourth blast furnace has been blown in at the works of Union des Consommateurs de Produits Metallurgiques et Industriels. Hauts Fourneau de Pompey in Lorraine has completed plans for development and modernization; work will begin early next year.

Machine Tool Orders Slump

DECLINING slightly from the August figure, new orders for machine tools in September registered a new low for the year.

September's new orders were 73.1 per cent of 1945-46-47 average shipments, according to National Machine Tool Builders' Association, Cleveland, a slight decrease from the 73.7 per cent posted the preceding month. Foreign orders also declined to 11.6 per cent of all new orders compared with 13.6 per cent in August.

Shipments, however, climbed to 84.7 per cent of the 1945-46-47 average in September compared to 69.8 per cent the preceding month. The ratio of unfilled orders to shipments, therefore, declined from 5.2 to 1 in August to 4.3 to 1 in September.

Cite Value of Standards

ACCELERATION in the activities of the American Standards Association and their contributions to government, business and industry were reflected in addresses and reports presented at the 30th annual meeting of the association at the Waldorf-Astoria, New York, Oct. 20-22.

THOMAS E. JOLLY

Thomas E. Jolly, vice president in charge of engineering and purchases, Aluminum Co. of America, Pittsburgh, was elected president of the association to succeed Frederick R. Lack, vice president, Western Electric Co., New York. Harold S. Osborne, chief engineer, American Telephone & Telegraph Co., New York, was elected vice president.

W. John Kenny, undersecretary of the Navy, outlined the military establishment's approach to simplification and standardization with special reference to the Munitions Board's cataloging and standardization program. This program is expected to save the country millions of dollars and should eliminate about 50 per cent of the 5 million items involved in military supply requirements.

Industry must be alert to the first hint of government control of standardization activities, Earl O. Shreve, president, Chamber of Commerce of the United States, warned the meeting. Although today the government serves as a technical assistant in these fields and has given real and practical aid, he said, standards must continue to be voluntarily determined and adopted by industry.

Move To Strike FTC Testimony

MOTIONS to strike the testimony introduced earlier this year by the Federal Trade Commission in its action against the old basing-point, delivered price system of the steel industry, were made by respondents' counsel Oct. 22. Objections to these motions, in turn, have been filed by Trial Attorney Lynn C. Paulson with Trial Examiner Frank Hier who expects to rule on the motions by Nov. 4. After that Mr. Hier will give the steel attorneys a "reasonable time" to file motions to limit the government's testimony. Expectations are that steel attorneys will start putting in their defense in December.

Calendar of Meetings . . .

Nov. 3-5, American Institute of Electrical Engineers: Southern district meeting, Birmingham. Institute headquarters are at 33 W. 39th St., New York.

Nov. 3-5, American Society of Body Engineers Inc.: Annual convention, Rackham Memorial Bldg., Detroit. Society headquarters are at 100 Farnsworth Ave., Detroit.

Nov. 3-5, Industrial Management Society: Twelfth annual national time and motion study clinic, at Sheraton Hotel, Chicago. Society headquarters are in the Midland Bldg., Chicago.

Nov. 4-5, Society of Automotive Engineers: Fuels and lubricants, The Mayo, Tulsa, Okla. Society headquarters are at 29 W. 39th St., New York.

Nov. 4-5, American Society for Quality Control and Chicago Association of Commerce: Third midwest quality control conference, Sherman Hotel, Chicago. Society headquarters are at 4949 W. 65th St., Chicago.

Nov. 5, Illinois Mining Institute: 56th annual meeting, Hotel Abraham Lincoln, Springfield, Ill. Institute secretary-treasurer is B. E. Schonthal, 28 E. Jackson Blvd., Chicago.

Nov. 5, American Iron & Steel Institute: Regional technical meeting, Mark Hopkins Hotel, San Francisco.

Nov. 5-6, Machinery Dealers' National Association: Machine tool conference, sponsored jointly by the association and Wharton School of Finance & Commerce, University of Pennsylvania; to be held in Philadelphia. Association headquarters are at 20 N. Wacker Dr., Chicago.

Nov. 8-9, Materials Handling Conference: 2nd annual meeting, sponsored by Westinghouse Electric Corp., at Hotel Statler, Buffalo.

Nov. 12, Pittsburgh Section of Open Hearth Committee, Iron & Steel Division, and Pittsburgh Section, AIME: Annual fall meeting, William Penn Hotel, Pittsburgh.

Nov. 14-17, National Tool & Die Manufacturers Association: Annual meeting, Hotel Schroeder, Milwaukee. Association headquarters are at 1412 Union Commerce Bldg., Cleveland.

Nov. 17-18, American Zinc Institute: Meeting of the Galvanizers Committee, Roosevelt Hotel, Pittsburgh.

Nov. 18-19, National Founders Association: Annual meeting, Sheraton Hotel, Chicago. Association executive vice president is L. E. Roark, 120 S. La Salle St., Chicago.

Nov. 18-19, American Management Association: Production conference, Drake Hotel, Chicago. Association headquarters are at 330 W. 42nd St., New York.

Nov. 28-Dec. 3, American Society of Mechanical Engineers: 69th annual meeting, Hotel Pennsylvania, New York. Society headquarters are at 29 W. 39th St., New York.

Nov. 29-Dec. 4, 18th National Exposition of Power & Mechanical Engineering: Power show, Grand Central Palace, New York.

Call for Fourth Round

American Federation of Labor serves notice it will ask for new wage increases next year

MAJOR labor unions are serving notice on management that they will demand a fourth round of postwar wage increases in 1949.

Latest to sound the drums for a new advance in rates is the American Federation of Labor. Several weeks ago, John L. Lewis warned that he will demand more for his United Mine Workers next spring. That the Congress of Industrial Organization will be far behind is unlikely.

Outlining its policy in the current issue of Labor's Monthly Survey, the AFL announced no fixed goal for 1949, but argued that wages have fallen steadily behind in the race with prices during the postwar period. In the last three years, the big unions have received wage increases of 18½, 15½ and 11½ cents an hour respectively.

Labor Well Nearly Dry

MORE immediate problem to many metalworking companies is the maintenance of adequate staffs of skilled and efficient workers in today's tight labor market. Unemployment is at an unprecedentedly low peacetime figure of around 2 million and few jobseekers can be obtained who have adequate skills or training.

In some instances the shortage of labor is restricting production, although generally a shortage of steel and other materials imposes a lower ceiling than labor supply.

Causing concern to metalworking companies and to the armed services is the question of how could the labor supply be increased should this country become involved in a national emergency.

Sees Acute Shortage—The armed services recently conducted a series of lecture courses at Detroit on economic mobilization in the event of an emergency, in which considerable emphasis was placed on labor supply. Commander E. G. Campbell estimated the total labor need in event of war would be 71.8 million, or 3.3 million more than the indicated supply.

Pointing out that the instability of the labor force during World War II was almost beyond belief because the government lacked adequate power to direct manpower to essential occupations, the Navy officer advocated a three-point labor program for use in an emergency: 1. All persons would be frozen on essential jobs until their positions of greatest usefulness could be determined; 2. use of wage or working condition inducements for recruiting labor would be forbidden; 3. all employers would be required to use employment offices to obtain extra help.

Bottom of the Barrel—Many companies already are resorting to unusual means of recruiting labor. Several aircraft companies have started regional recruiting drives reminiscent of the war. Some machine tool companies, recipients of large "phantom" orders from the National Security Resources Board, have dusted off their help wanted signs and enlarged their employment staffs.

Illinois State Employment Service recently revived its war born specialized recruiting unit to help Republic Steel and other firms obtain labor, the lack of which was restricting production. Republic estimated output of 12,000 to 15,000 tons of steel was being lost monthly for want of workers.

Draft Not Yet Big Factor—Selective Service drains on industrial worker staffs have not yet assumed large proportions. This situation, of course would change rapidly should the international conditions become more tense.

Parent Unions Liable for Violence

NATIONAL Labor Relations Board widely expanded responsibilities of international unions for acts of their locals in a double-barrel ruling last week.

The board held, three to two, that if an international officer takes no steps to stop violence, his mere presence during picket-line trouble is sufficient to hold the international and local union jointly liable. In the decision, the board, on another point, unanimously outlawed mass picketing when it encroaches on an individual's right to work. Rulings were made in the case of a strike by Local 6, International Longshoremen's and Warehousemen's Union against Sunset Line & Twine Co., Petaluma, Calif.

U.S. Drops Stainless Steel Suit

GOVERNMENT has dropped its antitrust suit against 18 manufacturers of stainless after they agreed to discontinue practices allegedly amounting to price fixing. Companies included represent 90 per cent of the industry.

SEVEN-MILE ROLLER COASTER: Some 4 million tons of crushed rock will get a ride in the next two years over this conveyor system from Lee's Mountain to the White River near Flippin, Ark., where it will be used in construction of the Bull Shoals Dam. These 13,888 idlers or rollers were made by Robins Conveyors Division, Hewitt-Robins Inc. Each idler must support the movement of 10 tons of rock every minute

SEE HOW "THE NEW ARITHMETIC IN STEEL"* MAKES EVERY FOURTH PART A BONUS PART

N-A-X HIGH-TENSILE stretches production per ton. Its greater strength and corrosion resistance make it possible to design sections an average of 25% lighter. That means one extra product for every three you are now building.

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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

New Cadillac engine lighter, more powerful than predecessor. Compression is 7.5 to 1, highest of any stock engine in production. Bore is greater than stroke

DETROIT

CADILLAC'S version of the high-compression engine, reputed to have been under development since 1939, except for an interruption during the war years, is a 90-degree, V-8, 160-horsepower job weighing 200 pounds less than the former 150-horsepower, L-head V-8 and providing a 10 to 20 per cent improvement in economy at compression ratio of 7.5:1, highest of any stock car engine now in production.

The engine also is reported to be the first "oversquare" type ever built, by which is meant that the bore is greater than the stroke. Bore is 3 13/16 inches and stroke 3 5/8, comparing with 3½ x 4½ inches in the 1948 engine. This 7/8-inch reduction in stroke means slower piston speeds and 12 per cent less cylinder wall surface exposed to the combustion flame, resulting in gains in both thermal and mechanical efficiency. At 4000 rpm, for example, the piston travel is only 2400 feet per minute as compared with 3000 in the former engine.

Pistons Nested — Much of the weight reduction has been made in the block by "nesting" the pistons down in the block. Pistons actually come out of the bore at the bottom by about 1 inch. At the same time there has been considerable "beefing up" of the engine structurally to permit eventual stepping up to much higher compression ratios without any major retooling. Main crankshaft bearings have been increased from three to five and they are placed in heavy bulkheads which form a rigid box-like crankcase structure. A new integral frontend casting, comprising water pump housing and inlet and outlet water manifolds, eliminates all hose connections except those running to lower and upper radiator tanks. Pistons are permanent mold aluminum castings and are of the slipper type with skeleton skirt, tending to reduce friction and lessen reciprocating weight. Valves are of the overhead type, with hydraulic valve lifters contributing to engine quietness.

Uses 88-Octane Gas—The engine requires premium fuel of 88 research octane rating, which is available now throughout the country. When octane ratings have been lifted to the 91-93 range, it will be possible to raise compression ratio of the engine to 8:1 by the simple expedient of making pistons a little "taller." This will permit further economy of operation. If and when still higher octane gasolines come on the market, the engine can be stepped up to a 10:1 ratio and perhaps eventually even to 12.5:1, considered to be the optimum for maximum economy. This can be done by changing the size of cores used in casting the block and will not require any major tooling revisions.

Some of the leading oil companies are not so sure the premium fuels required by the ultra-high compression engine will be available before a good many years. They feel the cost of building the necessary refineries is almost prohibitive, while the problem of distributing another grade of fuel is complicated. Some oil men say it would take them 25 years to make fuel for the 12.5:1 compression ratio engine a commercial reality, and indicate they have no intention of making changes in this direction until forced into it by public demand.

Whatever the oil industry does or does not do, at least General Motors is ready with two engines, Oldsmobile and Cadillac, which have basic designs readily revised for much higher compression. If oil companies do not produce the fuel, then the engines can stay as they are, still being vastly improved over preceding designs from the standpoint of economy and particularly smoothness, quietness and zip. The Cadillac, for example, accelerates from a standing start to 80 mph in 30 seconds with full throttle on a level straight-way.

Tooling Expensive—It costs plenty of money to tool up for mass production of these new power plants. Olds, it will be recalled, dumped in excess of $10 million into its new V-8 engine plant. Cadillac dished out around $6 million for machinery and tooling, including some 200 new machine tools with average cost of about $15,000 each. Much of the equipment used to build the former V-8 engine could be adapted to the new unit, so the change did not have to start from scratch as did the Olds development.

Cadillac wound up production of 1948 models last week and is scheduled to receive the first 1949 bodies Nov. 8. Few changes have been made in bodies except for a somewhat longer hood line and slightly lower grille. Rear fenders with their distinctive "fishtail" design are being continued without the slightest change.

Cadillac will build approximately 66,000 cars in the current calendar year, making it a new all-time high, topping 1941 output by 5000. Assemblies in 1947 were around 60,000 and the outlook for 1949 suggests a 10 per cent improvement, or close to 75,000 units. It is evident that Cadillac is being apportioned more than its proportionate share of steel in comparison with other GM Divisions, since none of the latter are up to their 1941 level of production. Explanation is a competitive one, since both Ford and Chrysler are allocating more steel to their higher-priced lines than they did in 1940-41.

Panel Redesigned—Instrument panel for the 1949 model has been en-

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,236	366,205
February	399,471	393,663
March	519,154	443,588
April	462,323	445,137
May	359,996	404,191
June	454,401	421,466
July	489,736	399,456
August	478,168	364,478
September	432,000*	444,501
October	510,000*	461,536
10 mos.	4,525,000*	4,144,221
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary.

Estimate for week ended:

	1948	1947
Oct. 9	119,398	98,978
Oct. 16	123,185	89,100
Oct. 23	122,817	106,159
Oct. 30	120,000	107,240

Estimates by Ward's Automotive Reports

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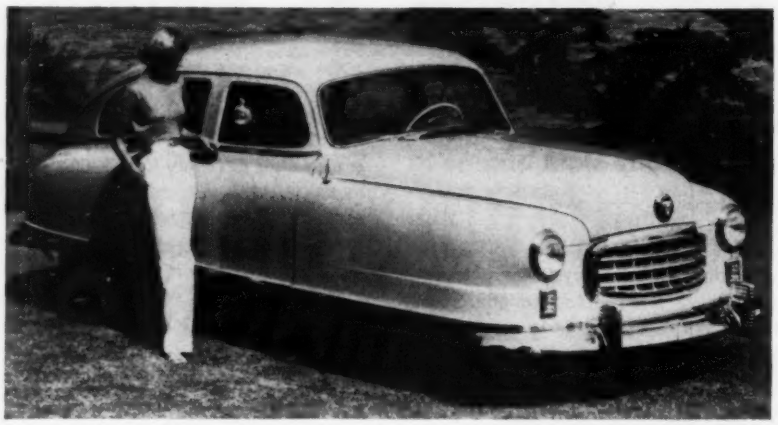


NEW NASH: Styling on the 1949 Nash Ambassador and 600 models follows the trend for more interior space and lowered center of gravity. This car is 62 inches high, has 63 inches of front seat elbow width and features a curved windshield without the conventional center post. NEA photo

tirely redesigned to do away with the airplane-type hooded cluster of instruments directly beneath the steering wheel. Objectionable glare developed in the 1948 arrangement and the instruments are now conventionally disposed on the panel. A number of manufacturers are having trouble with glare and reflections from glass covered instruments, particularly where curved glass is used in windshields. Usual technique is recess the instrument dials sufficiently to overcome reflections.

This recalls the instance of a leading manufacturer bringing out new models with brightly chrome plated radio grilles located on the upper part of the curved dash at the center. When sunlight bounced off the grille into the driver's eyes he was practically blinded, and rush orders were necessary to change specifications on all grilles to dull paint. Several thousand cars, however, went into the field with the plated grilles.

Cadillac is steering clear of connecting its new engine with the name of Kettering, not because of any lack of regard for the GM research genius but simply because it feels the engine is the outgrowth of studies begun 11 years ago. By 1938 the first wood model of the present engine was built and experimental parts were in production when the war interrupted activity. In 1945 design studies were resumed and two engines were built, one L-head and one valve-in-head. The latter proved far superior for high-compression operation, so between 1946 and 1948 more than 25 test engines were built and subjected to strenuous tests. One experimental and one production engine of the new design were run for more than 100 hours at 4250 rpm with full throttle and showed no appreciable wear, with oil consumption of only 26 pints. Four times the 1949 production engine was put through the grueling cycle of a 25,000 mile test run at the GM Proving Grounds and conclusively proved its stamina.

Discounts Power Braking

CHIEF engineer of one of the principal passenger car makers was asked what he thought of the possibilities of power braking being adapted to this field. He replied that he felt it was a long way off, principally because of the extra cost it would involve. In his opinion a more pressing requirement in brake development is the perfection of better cooling for present brakes, since the constant hanging on of more sheet metal to body structures is making it increasingly difficult for cooling air to circulate properly over brake drums.

New Axle Construction

UNUSUAL type of frame and chassis construction has been evolved for a new line of Dodge commercial vehicles know as route-vans. Rear axle design is particularly noteworthy, comprising separate driving and load-supporting axles. Sole function of the driving axle is to turn the rear wheels. It includes a differential assembly, connected to the wheels by open-type axle shafts, each having two universal joints, one at the wheel and one at the differential. The differential assembly is mounted in rubber on the chassis frame and moves up and down with the frame and body. Length and angularity of the axle shafts change with the deflection of the springs, necessitating a telescoping arrangement on each shaft to compensate for loads. With the unique arrangement, it is possible to lower the floor of the vehicle by 10 inches over former designs.

The 6-cylinder engine is offset to the right at the front, permitting use of front-end space formerly wasted. Engine hood is inside the body. Fluid coupling is interposed between engine and transmission for smoother starts and flexibility in traffic. Another unusual feature is an electrically controlled hydraulic service brake holder, actuated by a switch on the steering column bracket.

Auto Imports Skyrocket

AMERICA'S appetite for automobiles has skyrocketed imports. Bureau of the Census reports that 16,046 new cars (complete or chassis), other than trucks and busses, were imported into the United States during the first eight months of 1948.

Imports during all of 1947 amounted to only 1453 cars, and in 1939 to 298. Of the 16,046 automobiles imported in the first eight months, 15,321 were built in the United Kingdom.

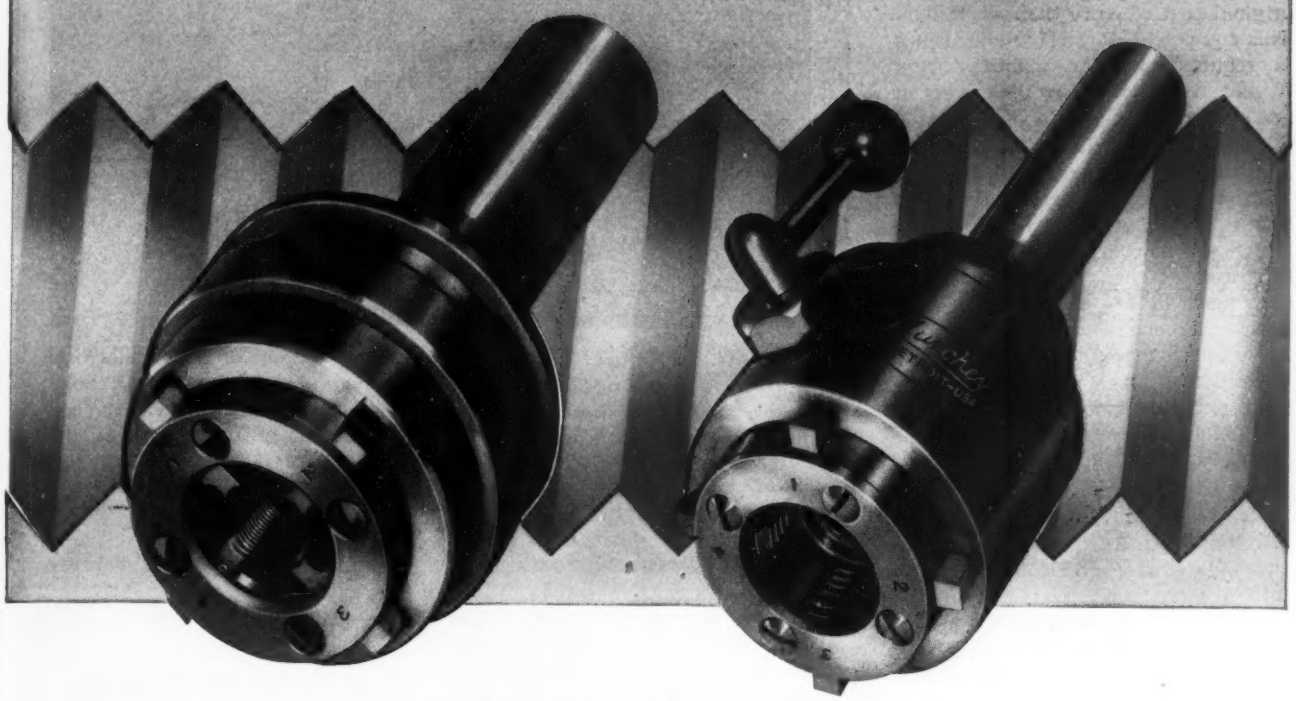
Revises Weekly Price Index

BEGINNING Nov. 19, Bureau of Labor Statistics will issue a new wholesale price index based on an abbreviated sample of 115 commodities drawn from the list of nearly 900 which is used to compute the comprehensive monthly index. Use of the abbreviated sample will make it possible to estimate the level of the monthly index in the first week after the close of each month.

Comparison of the 115 commodity sample with the monthly comprehensive index over a 14 month period, even during the present period of rapidly fluctuating prices, shows an average deviation of 0.24 per cent.

Since the new weekly index is based on a sample of about one-eighth of the commodities in the comprehensive sample, the bureau points out that the results are not so authoritative as if the full coverage had been used. It recommends, therefore, that businesses and other organizations with contracts under which payments are adjusted in accordance with movements of the bureau's wholesale price index, should use the monthly comprehensive index for this purpose and not the weekly series or the monthly estimate based on data used in the weekly index.

Lower cost per thread
WITH IMPROVED RADIAL CHASER DIE HEADS



THESE MURCHEY STANDARD DIE HEADS CUT THREADS IN SIZES FROM NO. 6 TO 6" IN DIAMETER

Larger sizes are available. Both are equipped with quick change chasers and snap action trip.

The "ORB" is used on automatic screw machines, drill presses or other machines which rotate the tool.

The "OLB" is a pull-off type self-opening unit for use on turret lathes, hand screw machines or other machines on which the tool remains stationary. It is ideal for short length threads or threading close to a shoulder because of a new trip adjustment. Size adjustment is controlled by a single nut at the forward end of the shank.

2934

The ease of handling

These tools and their simplicity of operation assure perfect threads at lowest cost. Ask for a demonstration in your own plant.

Lowest cost per thread . . .

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SUBSIDIARY OF THE SHEFFIELD CORP.
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Manufacturers of collapsible taps, self-opening die heads (tangent and radial chaser types) and special threading tools

J & H Consolidates

Firm buys WAA equipment and plans plant shifts for more concentrated structure

JACK & HEINTZ Precision Industries Inc., Cleveland, has completed arrangements with War Assets Administration for the purchase of machinery and equipment having an original cost of more than $5 million. This equipment, formerly under lease, is required for the manufacturing plans and programs now under way in the company.

Dickers for Bedford Units—Company also has started negotiations with WAA to purchase buildings 3 and 4, part of its Bedford, O., plants which are now held under lease. Accelerated activity in aviation products made by the company, together with other commercial product lines now being manufactured or under development, have made necessary certain rearrangements in the plant and manufacturing structure of the company.

As part of its overall program, Jack & Heintz also has decided to sell its Berea Rd. plant in order to consolidate manufacturing facilities into a more concentrated structure. This plant had been acquired by the predecessor firm, Jack & Heintz Inc., and is located about 15 miles from the main plants. Should this unit be sold, manufacturing operations now conducted there will be moved to another plant.

APPLIANCE PARADE: Volume production has begun on Apex Electrical Mfg. Co.'s newest appliance, an automatic washer. Firm built and equipped a 50,000-sq-ft addition to its main plant in Cleveland to set up lines to turn out this device which completes the full line of Apex home laundry equipment

Builds Cimcool Plant

CINCINNATI Milling Machine Co. is erecting a new plant on its grounds at Cincinnati to house the Cimcool (chemical emulsion) cutting fluid division.

The one-story building will contain space for manufacturing, chemical laboratories, shipping and receiving facilities and a purchasing department. The plant will be built of steel, brick, glass and insulated aluminum panels.

Sinclair Opens New Laboratories

HOW thoroughly the products of the oil industry pervade all other industries was brought into sharp focus with the opening of Sinclair Refining Co.'s new research and development laboratories at Harvey, Ill., Oct. 22.

Companies from coast-to-coast with only one thing in commom—use of oil—were represented, more than 2000 guests attending.

Located on a 20-acre landscaped tract, the laboratories, consist of nine buildings with a total of 215,000 square feet of floor space. The layout includes two large interconnected, three-story, air-conditioned buildings for administrative and general research activities, a 50-foot tall, six section pilot plant building, a 46,000 square foot engine laboratory containing 11 test cells, and smaller structures for distillation and catalyst activity tests, other research functions and services. Plant was designed and built by Austin Co., Cleveland.

AEC Negotiates for Uranium

UNITED States Atomic Energy Commission is conducting negotiations with Vanadium Corp. of America for purchase of uranium from two treatment plants to be brought into operation by Vanadium in 1949.

One of these plants is the Commission-owned vanadium-uranium mill at Durango, Colo., formerly owned by U. S. Vanadium Corp. The other is a new pilot unit to be erected by Vanadium Corp. of America at White Canyon in southeastern Utah.

Under terms of the tentative agreement, the Durango unit will be leased to Vanadium which will rehabilitate the plant at a cost of more than $200,000. Operations are scheduled to start in late 1949. Ore will be supplied principally by Vanadium's mines. The Utah facility, to be completed next summer, is being built to experiment with relatively unknown ores in that area.

Plant Expansion Projected

NATIONAL Motor Bearing Co., Redwood City, Calif., has started a major expansion program. The company manufactures oil seals and laminated metal shims.

Construction of a $700,000 factory in Southern California will soon be started by Arrowhead Rubber Co., a National Motor Bearing subsidiary. This subsidiary, which manufactures air ducts used principally by aircraft makers, reports a sharp increase in business as result of the stepped-up plane program.

Part of the business now being processed at the Redwood City plant will be handled at Van Wert, O., plant when new facilities there are completed.

Sylvania Acquires Ohio Plant

SYLVANIA Electric Products Inc., Boston, has acquired a plant at Ottawa, O., which will be converted to manufacture of cathode ray tubes for television sets.

Sylvania reports that demand for this tube far outruns its ability to fill its backlog of orders. Operations at the new plant are expected to get under way in a few months.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Interstate Steel Co., Chicago, has opened a Philadelphia office at 6701 N. Broad St. Saul Bradburd will be in charge.

—o—

Rust Engineering Co., Pittsburgh, has contracted to design and erect two crude oil topping units for Petrol Refining Inc. at its Texas City, Tex., refinery.

—o—

Southern Gas & Equipment Co., Sapulpa, Okla., has been sold by federal court direction to Bagwell-General Steel Co., Birmingham, for $190,000. The Birmingham company plans to return the firm to immediate production.

—o—

Alabama reports that production of coal in the state for the first nine months of 1948 was 13,242,200 tons, slightly below the 13,433,000 tons produced during the corresponding period last year.

—o—

Stoker Manufacturers' Association, Chicago, reports that factory sales of mechanical coal stokers in August totaled 10,879 units, an increase of 24 per cent over the 8798 units sold in July.

—o—

Youngstown Sheet & Tube Co., Youngstown, reports that its plants at Hubbard and Brier Hill, O., and South Chicago, Ill., have received awards from the National Safety Congress for safety records last year.

—o—

Department of Commerce, Office of International Trade, has issued a new edition of the Comprehensive Export Schedule, containing all e port control regulations in effect Sept. 30.

—o—

Inshield Products Co. has changed its name to Inshield Die & Stamping Co. and has begun operations in its new plant at 1931 Manhattan Blvd., Toledo, O.

—o—

Viking Products Co. Inc., 2373 E. Eight Mile Rd., Detroit, newly organized to produce automatic air valves, has completed its development program and installation of equipment for mass production at its Vicksburg, Mich., plant on a line of solenoid operated air valves.

—o—

Vanadium-Alloys Steel Co., Latrobe, Pa., has formed a subsidiary, Vanadium-Alloys Steel Societa Italiana, in co-operation with Elli, Zerboni & Co., Turin, Italy. New firm has been established to facilitate international trade in tool steel.

—o—

United States Testing Co. Inc., Hoboken, N. J., has established a Paris Bulletin Service, designed to give American manufacturers of household equipment and other products information on French developments in manufacturing, quality control, selling, etc. Mrs. Breene L. Wright is in charge of the bulletin, available to industry on a monthly-fee basis.

—o—

Borg-Warner International Corp., Chicago, will handle export activities of Warner Machine Products Inc., Muncie, Ind., manufacturer of water pumps.

—o—

Pennsylvania Railroad, Philadelphia, reports that production at its Altoona, Pa., works has begun on an order for 2000 heavy-duty gondola freight cars. Cars will go into service at the rate of 250 monthly.

—o—

Republic Steel Corp., Cleveland, reports that 25 of its 35 plants taking part in the annual Metals Section Safety Contest of the National Safety Council placed in their divisions or won reduction awards. Fifteen plants took first, second or third places.

—o—

Goodyear Tire & Rubber Co., Akron, has named Republic Supply Co., Houston, Tex., as a distributor for industrial rubber products.

—o—

Atlas Steels Ltd., Welland, Ont., recently held an open house at its Welland plant. Firm produces tool, stainless and specialty steels.

—o—

American Society for Metals reports that formation of a Utah chapter brings to 27 the number in the organization. W. C. Dyer, Geneva Steel Co., is chairman of the new unit.

—o—

Goodyear Aircraft Corp., Akron, subsidiary of Goodyear Tire & Rubber Co., has signed a contract with the Army Quartermaster Corps to repair about 3000 units of kitchen equipment, including refrigerators and deep-fat fryers.

—o—

E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., was owned by 94,557 different stockholders as of Sept. 30, an increase of 313 over the number of holders as of June 30 and an increase of 3573 over the number as of Sept. 30, 1947.

—o—

Westinghouse Electric Corp., Pittsburgh, booked new orders totaling $125,924,357 in August, a postwar high. Government orders made up a substantial portion of this total. Bookings in this one month were at least 50 per cent higher than bookings in either of the entire depression years of 1932 or 1933.

—o—

Luria Brothers & Co. Inc., Philadelphia, dealer in iron and steel scrap, has opened a San Francisco office. Stanley Clasber will be in charge.

—o—

General Electric Co., Schenectady, N. Y., has opened an apparatus service shop at Medford, Mass. This is the largest shop in the company's chain of 29 extending from coast to coast.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, reports that factory sales of standard-size household vacuum cleaners totaled 276,137 units in September, an increase of 16.4 per cent over sales in August.

—o—

Buda Co., Harvey, Ill., manufacturer of gas engines, railroad equipment and other products, has acquired W. F. Hebard & Co., Chicago, maker of materials handling equipment. The Hebard line will be continued and the company becomes a Buda subsidiary.

—o—

Federal Motor Truck Co., Detroit, manufacturer of motor trucks and parts, has purchased a plant in Detroit from War Assets Administration for $300,000. Company has been occupying the unit under lease since June, 1946.

—o—

Lindberg Steel Treating Co., a subsidiary of Lindberg Engineering Co., Chicago, has begun operations at 3537 E. 25th St., Los Angeles. J. B. Froblom is manager.

—o—

E. F. Houghton & Co. Ltd., Toronto, Ont., an affiliate of E. F. Houghton & Co., Philadelphia, has opened a new plant at 100 Symes Rd., Toronto. Facility is for manufacture of metalworking and heat treating products, lubricants and related items.

—o—

Debevoise-Anderson Co., dealer in pig iron, coke, ore and affiliated materials, has moved its New York office from 155 Liberty St. to 115 E. 44th St.

The Business Trend

INDUSTRIAL production forged upward to a new postwar peak for the week ended Oct. 23, sending STEEL's index to 178 per cent (preliminary) of the 1936-1939 average. This record mark topped the previous high established the preceding week.

STEEL—A new peacetime peak was reached in output of steel for ingots and castings in the week ended Oct. 23, as the rate rose to 98.5 per cent of capacity. Production of 1,786,300 net tons for the week was only 5000 tons lower than the all-time peak reached in the wartime week of Apr. 24, 1944.

AUTOMOBILES—Despite a one-day strike at one large plant, automobile and truck production for the week ended Oct. 23 was 122,817 units, just 368 short of the postwar record of 123,185 completed the week before. To reduce "down time" for model changeovers, manufacturers are installing new equipment, insofar as is possible, without interrupting the flow of current models. One of the major limiting factors in production is the availability of steel and the industry hopes it will be able to increase its supply of the metal during the coming year.

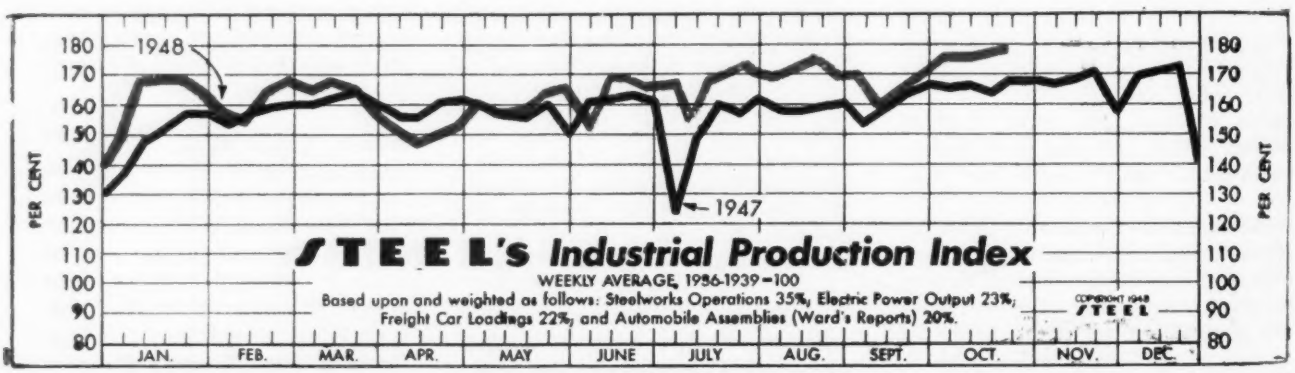
CONSTRUCTION—Building and heavy engineering construction, based on a dollar valuation of contract commitments reported for the 37 states east of the Rocky mountains, was 30 per cent higher in the first nine months of 1948 than in the corresponding period of 1947. The record is being established principally because of gains in noncommercial building contracts which were held up during and immediately after the war by the priorities system. Contracts for buildings used for manufacturing purposes, on the other hand, showed a 4 per cent decline compared with the volume reported for the first three quarters last year.

PRODUCTION—Industrial production, as reported by the Federal Reserve Board in its seasonally adjusted index, was at 191 per cent of the 1935-1939 average during September, duplicating the level for the preceding month. This is only slightly below the postwar high of 194 per cent last February. Manufacturing output in September showed a small gain while minerals production declined 3 per cent.

PRICES—Wholesale primary market prices advanced 0.1 per cent to 164.8 per cent of the 1926 average during the week ended Oct. 16, according to the Bureau of Labor Statistics. Among items that advanced were pig iron, alloy steel bars, gray iron castings, cast iron pipe and farm machinery.

CARLOADINGS—Loading of revenue freight for the week ended Oct. 16 rose 22,021 cars or 2.5 per cent above the preceding week and totaled 913,832 cars, highest this year. However, this figure is 4.2 per cent below the total for the corresponding week last year.

BUSINESS—Number of business failures in September dropped to 398 from 439 in August and was the smallest total for any month since January. The decrease was consistent with the usual seasonal trend, but compared with the same month in previous years failures were highest since 1942.



Index (chart above): Week ended Oct. 23 (preliminary) 178 Previous Week 177 Month Ago 169 Year Ago 168

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	98.5	98.0	96.0	95.5
Electric Power Distributed (million kilowatt hours)	5,539	5,482	5,461	4,964
Bituminous Coal Production (daily av.—1000 tons)	1,998	1,980	1,983	2,123
Petroleum Production (daily av.—1000 bbl.)	5,596	5,586	5,343	5,295
Construction Volume (ENR—Unit $1,000,000)	$129.0	$170.2	$146.8	$141.7
Automobile and Truck Output (Ward's—number units)	122,817	123,185	97,424	106,159

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

TRADE				
Freight Carloadings (unit—1000 cars)	901†	914	908	955
Business Failures (Dun & Bradstreet, number)	124	94	101	81
Money in Circulation (in millions of dollars)‡	$28,157	$28,284	$28,083	$28,569
Department Store Sales (changes from like wk. a yr. ago)‡	+11%	+10%	+12%	+1%

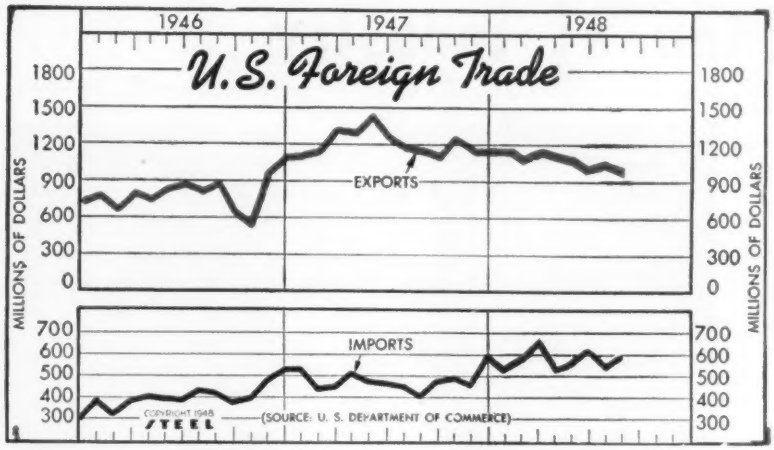
† Preliminary. ‡ Federal Reserve Board.

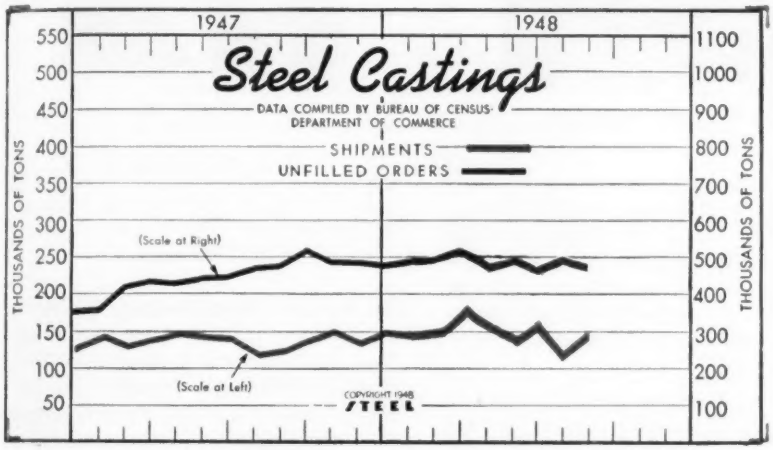
Foreign Trade

Bureau of Foreign and Domestic Commerce

(Unit Value—$1,000,000)

	Exports			Imports		
	1948	1947	1946	1948	1947	1946
Jan.	1,091	1,114	798	546	531	394
Feb.	1,086	1,146	670	582	437	318
Mar.	1,141	1,327	815	666	444	384
Apr.	1,123	1,299	757	527	512	406
May	1,103	1,503	851	549	474	393
June	1,013	1,320	878	616	463	382
July	1,022	1,265	826	559	450	431
Aug.	988	1,265	883	598	400	422
Sept.	....	1,109	643	...	481	377
Oct.	....	1,235	536	...	492	394
Nov.	....	1,138	986	...	455	478
Dec.	....	1,112	1,097	...	601	529





Steel Castings

(Net tons in thousands)

	Shipments		Unfilled Orders*	
	1948	1947	1948	1947
Jan.	141.1	139.0	491.7	365.5
Feb.	142.4	125.6	497.1	421.4
Mar.	162.9	134.9	508.8	434.9
Apr.	150.3	144.2	472.4	427.6
May	143.3	140.9	482.5	443.2
June	152.9	139.0	470.0	445.5
July	120.4	117.0	497.4	473.9
Aug.	140.2	120.4	472.5	478.6
Sept.	....	137.4	....	526.2
Oct.	....	148.4	....	497.3
Nov.	....	130.1	....	493.3
Dec.	....	148.1	....	489.4

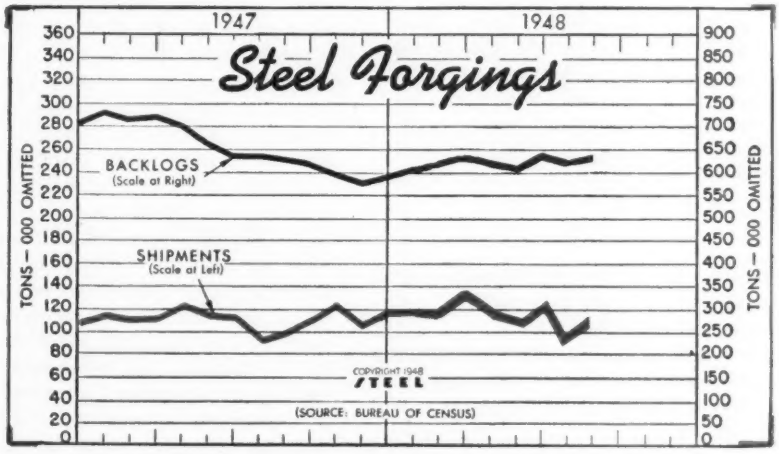
* Castings for sale.

Steel Forgings

(Tons—000 omitted)

	Shipments*		Unfilled Orders*	
	1948	1947	1948	1947
January	118	116	618	723
February	117	111	631	714
March	131	115	641	717
April	114	121	628	699
May	109	116	624	663
June	120	112	641	639
July	97	92	627	631
August	111	98	634	626
September	...	109	...	617
October	...	124	...	594
November	...	104	...	586
December	...	117	...	594

* Forgings for sale.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$15,825	$10,842	$16,185	$15,185
Federal Gross Debt (billions)	$252.3	$252.4	$252.2	$259.1
Bond Volume, NYSE (millions)	$19.8	$11.9	$13.6	$26.2
Stocks Sales, NYSE (thousands)	6,933	3,625	4,132	7,677
Loans and Investments (billions)†	$62.1	$62.2	$63.7	$64.6
United States Gov't. Obligations Held (millions)†	$33,022	$33,235	$34,744	$38,103

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$95.05	$95.05	$95.05	$75.41
All Commodities†	164.8	164.6	169.2	157.9
Industrial Raw Materials†	177.2	176.7	182.0	176.0
Manufactured Products†	160.6	160.5	165.5	151.1

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

ALDEN G. ROACH

RALPH W. MORRISON

DR. JOHN G. DEAN

Effective Nov. 15, 1948, **Alden G. Roach,** president of Consolidated Western Steel Corp., will succeed **J. Lester Perry** as president of Columbia Steel Co., the steel producing subsidiary of U. S. Steel Corp. on the Pacific Coast. Mr. Perry, formerly president, Carnegie - Illinois Steel Corp., another subsidiary company, was called back from retirement May 1, 1947, to assume the presidency of Columbia, following the death of its president, **William A. Ross.** After Nov. 15, Mr. Perry will remain with U. S. Steel Corp., serving in an advisory capacity. Mr. Roach, the new president of Columbia, will continue as president of Consolidated Western Steel, which recently became a subsidiary of U. S. Steel Corp.

—o—

T. Spencer Shore has been elected president of Eagle-Picher Co., Cincinnati, and assumes office Jan. 1, 1949. He succeeds **Joel M. Bowlby,** who has been president since 1941, and who becomes chairman of the board. Mr. Bowlby also continues as chief executive officer and general manager of operations of the Eagle-Picher group. **Joseph Hummel Jr.,** associated with the company for 57 years and board chairman since 1941, has vacated that office and has been appointed honorary chairman. **Elmer Isern,** formerly vice president, Eagle-Picher Mining & Smelting Co., has been elected president of that subsidiary, and Mr. Bowlby assumes chairmanship of the board.

—o—

West Steel Casting Co., Cleveland, announces the appointment of **Reginald G. Ullman** as sales manager. Before joining the company in 1946 Mr. Ullman was associated for five years with American Car & Foundry Co. in its Cleveland and Pittsburgh sales offices. Until taking over the sales manager's duties, he did sales development work with the railroad, mining, automotive truck, agricultural and other users of steel castings.

—o—

Ralph W. Morrison has been appointed general sales manager of Aro Equipment Corp., Bryan, O. He joined the company in 1940 in the capacity of Detroit Division manager, after having had sales experience with both air and electric tools. In 1941 he was made assistant sales manager of the Air Tool Division of the corporation, and later was promoted to sales managership of that division. **E. W. Iman** has been promoted by the company to sales manager of the Lubricating Equipment Division after having served several years in the factory sales department and as assistant sales manager. **E. L. Jackson** has been made sales manager, Industrial Tool Division, **M. J. Anderson** appointed manager of Fittings Division, and **G. S. King** appointed advertising manager of the corporation.

—o—

Edson W. Forker has been named president, and **George E. Kopetz** and **Ralph E. Moser** have been named vice presidents of the Chemical Plants Division, Blaw-Knox Construction Co., Pittsburgh. Mr. Forker joined Blaw-Knox Co. in 1927, and is a vice president of the Blaw-Knox Division in charge of process equipment. He has managed the Chemical Plants Division since its formation in 1939.

—o—

W. V. O'Brien has been appointed general sales manager, apparatus department, General Electric Co., Schenectady, N. Y. He has been assistant general sales manager in that department for the past year.

—o—

Dr. John G. Dean has been appointed head of the industrial chemicals section, Development & Research Division, International Nickel Co. Inc., New York. **O. B. J. Fraser,** assistant manager of the company's Development and Research Division, has been directing the section, previously. Dr. Dean has been associated with the chemicals section since 1942, serving first as Senior Fellow for International Nickel's multiple fellowship at Mellon Institute for Industrial Research in Pittsburgh, and later as Advisory Fellow to that program, with headquarters in New York.

—o—

Charles E. Palmer, former vice president, Frank D. Palmer Inc., manufacturer of packaging machinery, Chicago, has been elected president of the firm succeeding **Frank D. Palmer,** who has been elected chairman of the board.

—o—

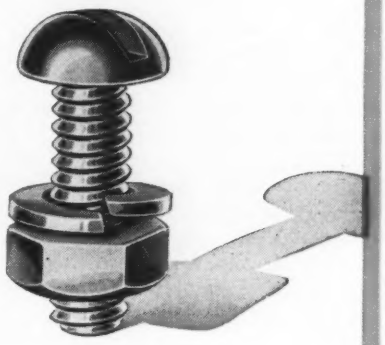
Lloyd Young, sales department, Rockwood Mfg. Co., Indianapolis, has been appointed sales manager in charge of manufacturers sales. He has been associated with the company 20 years.

—o—

Frank T. Kalas, vice president in charge of sales and a director of Electric Storage Battery Co., Philadelphia, has retired after 49 years of service with the company. **Carl F. Norberg,** vice president in charge of manufacturing, has been elected a director to fill the vacancy caused by the retirement of Mr. Kalas. Mr.

This takes 8 seconds . . .

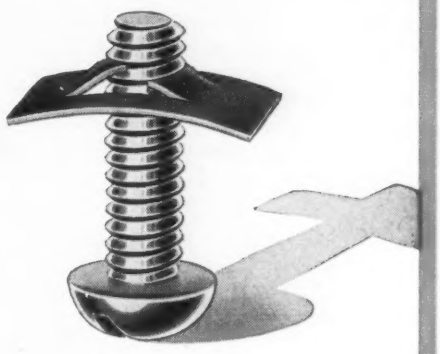
That's the average time required to install a threaded nut, lock washer and screw, using a power screwdriver.



This takes 5 seconds . . .

A savings of 37½% in time—because no lock washer is needed—no wrench is ever required! SPEED NUTS* start easier, pull down faster.

NOTE: Figures based on study conducted by independent time-study engineers.



The stop watch tells the story. Flat-type SPEED NUTS can be applied much faster than threaded nuts and lock washers. This time-savings can mean real dollar-savings in your assembly costs.

Time-saving is a primary feature of the entire SPEED NUT System of Fastenings. Push-On type SPEED NUTS zip over unthreaded studs. SPEED CLIPS snap into position. SPEED CLAMPS combine several parts into one for quick installation.

Here's an example of proved savings: A leading vending machine manufacturer has reduced his assembly costs 25% with the SPEED NUT brand of fasteners. *Your* specific fastening problems may be answered in a comprehensive analysis prepared by Tinnerman engineers. Write for details on this service, and for your copy of the new SPEED NUT bulletin. TINNERMAN PRODUCTS, INC., 2038 Fulton Rd., Cleveland 13, Ohio.

In Canada: Dominion Fasteners Limited, Hamilton
In England: Simmonds Aerocessories, Ltd., Treforest
In France: Aerocessoires Simmonds, S.A., Paris

TINNERMAN *Speed Nuts*

® Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS — MORE THAN 4000 SHAPES AND SIZES

Norberg was also granted executive authority and vested with the power to perform the duties of the president or executive vice president in the event of their absence or inability to act. **Roland Whitehurst,** Exide sales manager, has been elected vice president in charge of sales, succeeding Mr. Kalas in that position. Mr. Whitehurst has been connected with Electric Storage Battery Co. for 40 years. He was manager of the Washington branch for 20 years, served later as assistant sales manager of the company, and in 1944 was promoted to sales manager.

—o—

Wheel Trueing Tool Co., Detroit, announces the appointment of **Arthur J. Baehr** as representative in the Pittsburgh area. Mr Baehr has represented the company in the Cleveland area for some time past. He will continue to make his business headquarters at Chagrin Falls, O.

—o—

Paul H. Davey, president, Davey Compressor Co., Kent, O., was honored Oct. 15 by presentation of a War Department - Navy Department certificate of appreciation in recognition of his services to the Office of Scientific Research & Development.

—o—

Harry F. Gracey, director of management development of SKF Industries, New York, has been elected as Pennsylvania representative on the board of directors of the American Society of Training Directors.

—o—

W. B. Turner has been appointed commissioner of the Metal Lath Manufacturers Association, Cleveland. He previously had been with Inland Steel Products Co., Milwaukee, serving for 15 years as manager of sales, Fireproof Materials Division. Mr. Turner has many years' service with the Metal Lath Manufacturers Association, and is, at present, president of that organization, which office he has held on several previous occasions.

—o—

Commercial Pacific Cable Co., an associate of International Telephone & Telegraph Corp., New York, has elected **Frank Flynn** as president. He has served as vice president of the company for the past six years. Mr. Flynn joined the company in 1925 as treasurer, and in the intervening period has also served as comptroller, Commercial Cable Co. and of Mackay Radio & Telegraph Co.

—o—

H. L. Edinger, Barnett Foundry & Machine Co., Irvington, N. J., has been elected president of the New Jersey Foundrymen's Association, succeeding **Max Traum,** Sacks-Barlow Foundries Inc., Newark. **E. B. Smith,** American Brake Shoe Co., New York, has been named vice president, and **J. A. Williamson** and **John L. Carter,** both of Newark, have been re-elected treasurer and secretary, respectively.

—o—

Joseph J. Osborn has been named manager of the recently opened office in Washington, for VISIrecord Inc., Long Island City, N. Y.

—o—

H. B. Brown, who recently joined Inland Steel Products Co., Milwaukee, after many years of experience in the manufacture and distribution of fireproof building materials, has succeeded **W. B. Turner** as manager of sales, Fireproof Materials Division of that company. Mr. Turner has been elected commissioner, Metal Lath Manufacturers Association, Cleveland.

—o—

George H. Sahler has been appointed manager of marketing research, Trumbull Electric Mfg. Co., Plainville, Conn. **William A. Edwards** has been appointed manager of switch, breaker, control sales of the company, and **Yale T. Chaney** has been appointed manager of distribution systems sales.

—o—

Col. John Slezak, president, Turner Brass Works, Sycamore, Ill., has been elected to membership on the board of trustees of Illinois Institute of Technology. He is chairman of the board of Kable Bros. Co., Mt. Morris, Ill., and a director of Whiting Corp., Illinois Bell Telephone Co., Felt & Tarrant Mfg. Co., and Burgess-Norton Mfg. Co.

—o—

Roy H. Smallwood has been appointed sales manager, Lull Mfg. Co., Minneapolis. He has been connected with Wm. H. Ziegler Co., American Hoist & Derrick Co., and George T. Ryan Co., all directly connected with the construction equipment industry.

—o—

Cleco Division, Reed Roller Bit Co., Houston, Tex., announces appointment of **Victor E. Dolan** as special representative at Chicago. He will act as liaison between the general sales office in Houston, and local dealer organizations.

—o—

Arden A. Freel has been appointed superintendent of yards and transportation department at the South Chicago plant of Carnegie-Illinois Steel Corp., U. S. Steel Corp. subsidiary. He has been assistant superintendent of the west mills department for the past two years.

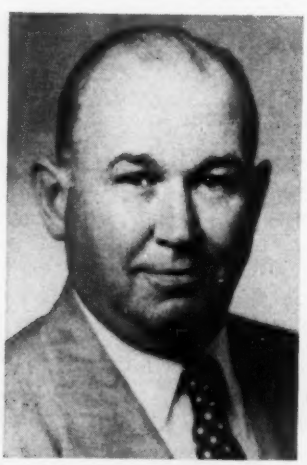
—o—

Southern Chapter, Institute of Scrap Iron & Steel Inc., announces re-election of the following officers: **Nathan S. Addlestone,** Addlestone & Co., Sumter, S. C., president; **Leo J. Kelleher,** Southern Converting Co., Greensboro, N. C., first vice president; **Morris Brenner,** Brenner Iron & Metal Co., Winston-Salem, second vice president; **Sol Levin,** Levin Bros., Burlington, N. C., third vice president; and **Hy Helbein,** Southern Metals Co., Charlotte, N. C., secretary-treasurer.

—o—

Paul L. Palmerton, assistant to the president, Western Electric Co., New York, has been elected comptroller of the company's Purchasing & Traffic Division, a newly created post. He has been with Western Electric since 1929, when he was appointed foreign manager of Electrical Research Products Inc., then a company subsidiary. He has since been European manager, and, after Electrical Research Products Inc., merged

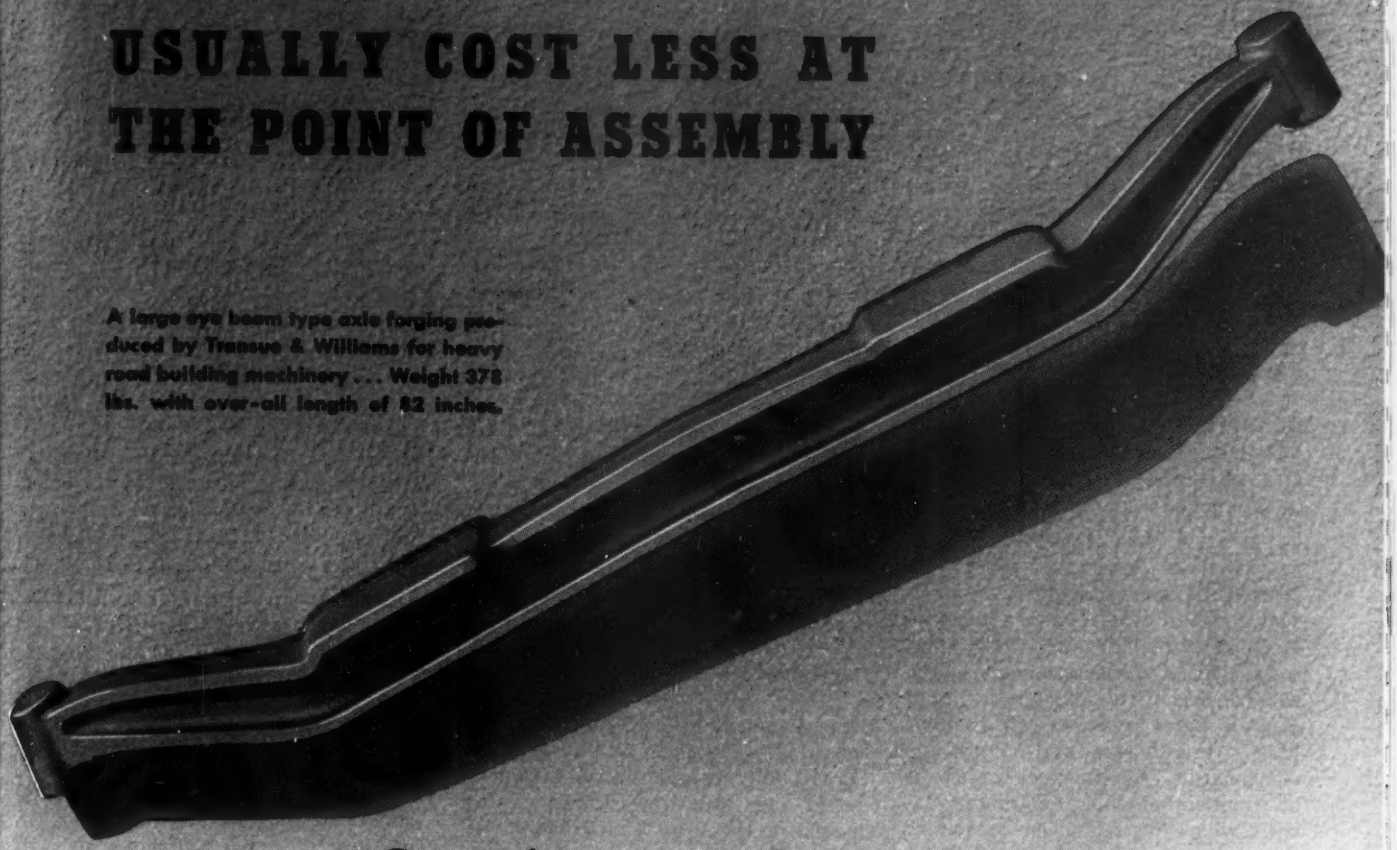
W. B. TURNER



H. B. BROWN

TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY



A large eye beam type axle forging produced by Transue & Williams for heavy road building machinery . . . Weight 378 lbs. with over-all length of 82 inches.

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TRANSUE & WILLIAMS

STEEL FORGING CORPORATION • ALLIANCE, OHIO

SALES OFFICES: NEW YORK • PHILADELPHIA • CHICAGO • INDIANAPOLIS • DETROIT • CLEVELAND

OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

with the parent company in 1940, manager of the sales department, service manager, radio merchandise manager, assistant manager of the Radio Division, and assistant to the president.

—o—

Dale B. Sayre has been named vice president and director of marketing of Indian Motocycle Co., Springfield, Mass. He is the former director of Cushman Motor Works Inc.

—o—

Don McKim, recently executive secretary of the National Standard Parts Association, has been made general sales manager of the F & B Mfg. Co., Chicago, maker of ignition parts.

—o—

D. W. Gunn, special representative for the equipment tube sales department, has been appointed assistant to the general sales manager of the Radio Tube Division, Sylvania Electric Products Inc., New York.

—o—

O. L. Dunn, former treasurer and assistant secretary, General Electric Medical Products Co., Chicago, has been named comptroller, General Electric X-Ray Corp., Milwaukee.

—o—

John W. Hooper, formerly vice president in charge of finance, American Machine & Foundry Co., New York, resigned that position, and has been elected executive vice president of Lincoln Savings Bank of Brooklyn, N. Y. He will remain a director and chairman of the finance committee of American Machine & Foundry Co., with which he has been associated in an executive financial capacity for more than 23 years.

—o—

Marcus E. Borinstein, for the past four years manager of ferrous and nonferrous scrap merchandising for James Flett Organization Inc., Chicago, has been named a vice president of the firm. He will continue in merchandising, but in addition will be general manager of the company's Western Division.

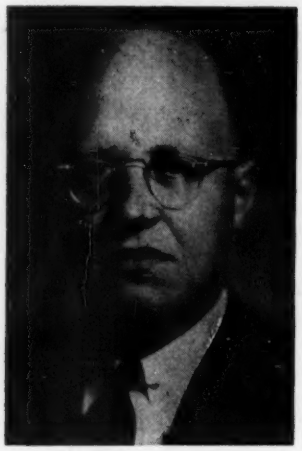
—o—

James M. Black Jr. has been appointed public relations director for Associated Industries, Cleveland organization of manufacturing companies. Mr. Black previously held the position of public relations director of ATF Inc., Elizabeth, N. J.

—o—

G. H. Grossnickle has been appointed manager, Meter Division, Newark, N. J., Westinghouse Electric Corp. **Edward X. Hallenberg** has been appointed assistant director of the corporation's research laboratories, and

CARL J. MURRAY



WILLIAM S. BEGG

Frank Paeske has been appointed manager of miniature lamp sales, Bloomfield, N. J.

—o—

Carl J. Murray has been appointed general superintendent, Jessop Steel Co., Washington, Pa. He formerly was assistant manager of Colorado Fuel & Iron Corp. **Edward J. Sherrill** has been named superintendent of production scheduling and shipping; **Ellsworth E. Seitz,** director of personnel relations; **Norris B. McFarlane,** superintendent of electric furnace department; **Edwin C. Thomas Jr.,** superintendent of bar mills; and **James O. McDowell,** superintendent of sheet mills.

—o—

Dr. Vannevar Bush, until recently chairman, Research & Development Board, National Military Establishment, has been awarded the 1949 medal of the Industrial Research Institute Inc., New York.

—o—

Frank J. Dvorak and **Roy J. Sund** have been elected directors, Marathon Corp., Rothschild, Wis. Mr. Dvorak is assistant to the president, and Mr. Sund, vice president of the company. **Donald A. Snyder,** director of sales, has been elected a vice president.

—o—

Dr. Charles E. Reed, manager, Chemical Engineering Division, chemical department of General Electric Co., at Pittsfield, Mass., has been appointed engineering manager of that department. Under the new chemical department organization, which establishes two operating divisions instead of four, **Harry K. Collins** and **John L. McMurphy** have been named to managerial posts of the Plastics Division and the Chemicals Division of the department, respectively. **Robert L. Gibson,** formerly manager of the Plastics Division, has been named assistant general manager of the chemical department.

—o—

William S. Begg has been appointed vice president and secretary of American Steel & Pump Corp., New York, of which the FitzSimons Steel Co. is an operating subsidiary. Mr. Begg has also been appointed an officer and director of FitzSimons Steel Co. He brings to the corporation and its operating subsidiaries a background of 15 years' experience as a lawyer.

—o—

Clarkson Hill has been appointed director, accounting and cost planning, for the Glass Division, Pittsburgh Plate Glass Co., Pittsburgh. During the past two years he has served as chief cost accountant for the firm.

—o—

T. C. Ballou has been appointed sales agent at New York, representing American Car & Foundry Co. in the northeastern railroad area. He has been with the company since 1936, specializing in welded products and tank cars.

—o—

Howard C. La Mere has been appointed to represent the Automatic Control Co. in the Chicago area. For the past several years he has handled the company's line in Minneapolis.

—o—

L. Rene Galennie has been appointed director of personnel, Fairbanks, Morse & Co., Chicago. He had been associated with Richardson Co., Chicago, and prior to that was staff consultant, Stevenson, Gordon & Harrison Inc., also of Chicago. He will have headquarters at Beloit, Wis., where the largest unit of the company is located, and will take over his new duties Nov. 1.

—o—

C. I. MacGuffie and **R. C. Freeman** have been appointed manager of sales and manager of engineering, respectively, of the Welding Divisions, Gen-

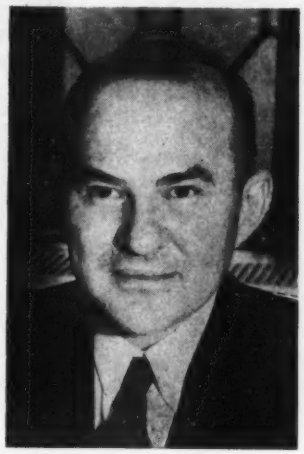
eral Electric Co., Schenectady, N. Y. Mr. MacGuffie was formerly manager of sales for the company's Welding Equipment Division, and Mr. Freeman was formerly division engineer for D-C Welders at the company's Fitchburg, Mass., plant.

—o—

Daniel H. Haynes, vice president and director, American Machine & Foundry Co., and president of its affiliate, International Cigar Machinery Co., will become AMF treasurer, Jan. 1, 1949, succeeding **John W. Hooper.** Mr. Haynes' appointment as treasurer will be in addition to his current official posts. Mr. Hooper will remain as a director and chairman of the finance committee of the company. **David S. Meiklejohn** and **George A. Ingalls** will continue as assistant treasurer and comptroller, respectively. Mr. Haynes has been a director of American Machine & Foundry Co. and International Cigar Machinery Co. since 1915. He was named a vice president of both organizations in 1922 and president of ICM in 1941.

—o—

Globe Steel Tubes Co., Milwaukee, announces the appointment of **Lee Mullen** as vice president in charge of sales. He had previously served as general manager of sales for the company. Mr. Mullen was employed as a district sales representative for Republic Steel Corp., and later joined Pittsburgh Steel Co. At the time he left this concern for war duty he was manager of all tube sales. He joined Globe Steel Tubes Co. after the war.



OTTO L. SCHWENG

Appointed director of market research, Diamond Alkali Co., Cleveland. Noted in STEEL, Oct. 25 issue, p. 65

—o—

Harry P. Smith, formerly New York district sales manager, Mathieson Chemical Corp., New York, has been made assistant general manager of sales, with headquarters in the company's New York offices. Prior to joining Mathieson sales department in 1944, Mr. Smith was president of George Chemical Co., now a division of Diamond Alkali Co.

—o—

W. T. Gettig has been appointed works manager of Edward Valves Inc., East Chicago, Ind., manufacturer of cast and forged steel valves. He joined the company in 1933 as a machine tool operator, and successively served as a methods engineer, supervisor of the methods department, assistant production manager, and production manager. In his new position Mr. Gettig has over-all charge of manufacturing, industrial and personnel relations, and industrial engineering.

—o—

George C. Delp has been elected a vice president of Sperry Corp., New York. He is president and general manager of New Holland Machine Co., New Holland, Pa., a Sperry subsidiary.

—o—

Robert H. Ferguson, manager of safety, Republic Steel Corp., Cleveland, has been elected president of American Society of Safety Engineers.

OBITUARIES . . .

Richard J. Blum Sr., co-founder and president, Kirk & Blum Mfg. Co., Cincinnati, died recently. Mr. Blum and Sylvester W. Kirk founded the company in 1905. Mr. Blum became president of the firm three years ago, succeeding to that position upon the death of Mr. Kirk.

—o—

Alain M. Madle, 57, chief electrical engineer, Briggs & Stratton Corp., Milwaukee, died Oct. 21 after a short illness. Born in Vienna, Austria, Mr. Madle came to this country in 1927 and was with the New Departure Division, General Motors Corp., at Bristol, Conn., until 1935. He joined the Briggs & Stratton Corp. in 1939.

—o—

David G. Kerr, 84, retired vice president, United States Steel Corp., and one of the partners of the late Andrew Carnegie, died Oct. 17 in Pittsburgh. He joined Mr. Carnegie's organization in 1884. After serving in various executive positions with that organization he was made vice president of the Carnegie Steel Co. when U. S. Steel Corp. was organized in 1901. In 1908 Mr. Kerr was elected a vice president of U. S. Steel in charge of its ore, limestone and coal interests. He retired in 1932.

—o—

George J. Chapman, 57, assistant manager, appliance and merchandise department of General Electric Co., at Greenwich, Conn., died Oct. 19 at his home in that city. He had been with General Electric since his graduation in 1913 from Syracuse University.

—o—

Milton P. Vore Jr., 61, secretary and treasurer, Republic Flow Meters Co., Chicago, died Oct. 20.

—o—

Charles K. Anderson, 84, a director of National Standard Co., Niles, Mich., died Oct. 19. He was president of C. K. Anderson Realty Co., Chicago. In 1907 Mr. Anderson organized the American Wire Fabrics Co. and began making screen wire. He also organized the National Wire Cloth Co., Niles, Mich., a predecessor of National Standard Co.

—o—

Eugene M. Marchand, 47, plant engineer of the Sandusky, O., plant, New Departure Division, General Motors Corp., died Oct. 20 after being stricken while working at his desk.

—o—

Robert W. Porter, 60, assistant to the president, National Radiator Co., Johnstown, Pa., died at his home at South Orange, N. J. He was associated with NRC as a management consultant from 1931-1933, maintaining offices at New York. He joined National Radiator Co. in 1946.

—o—

Godfrey Gort, 63, founder and president, Western Railroad Supply Co., Chicago, died Oct. 24.

—o—

Edward B. Yancey, 60, under whose direction E. I. du Pont de Nemours & Co. built and operated the Hanford, Wash., atomic-energy plant during World War II, died Oct. 24. He was a vice president and member of the board of directors and executive committee of the du Pont company. During the war he was general manager of the company's explosives department.

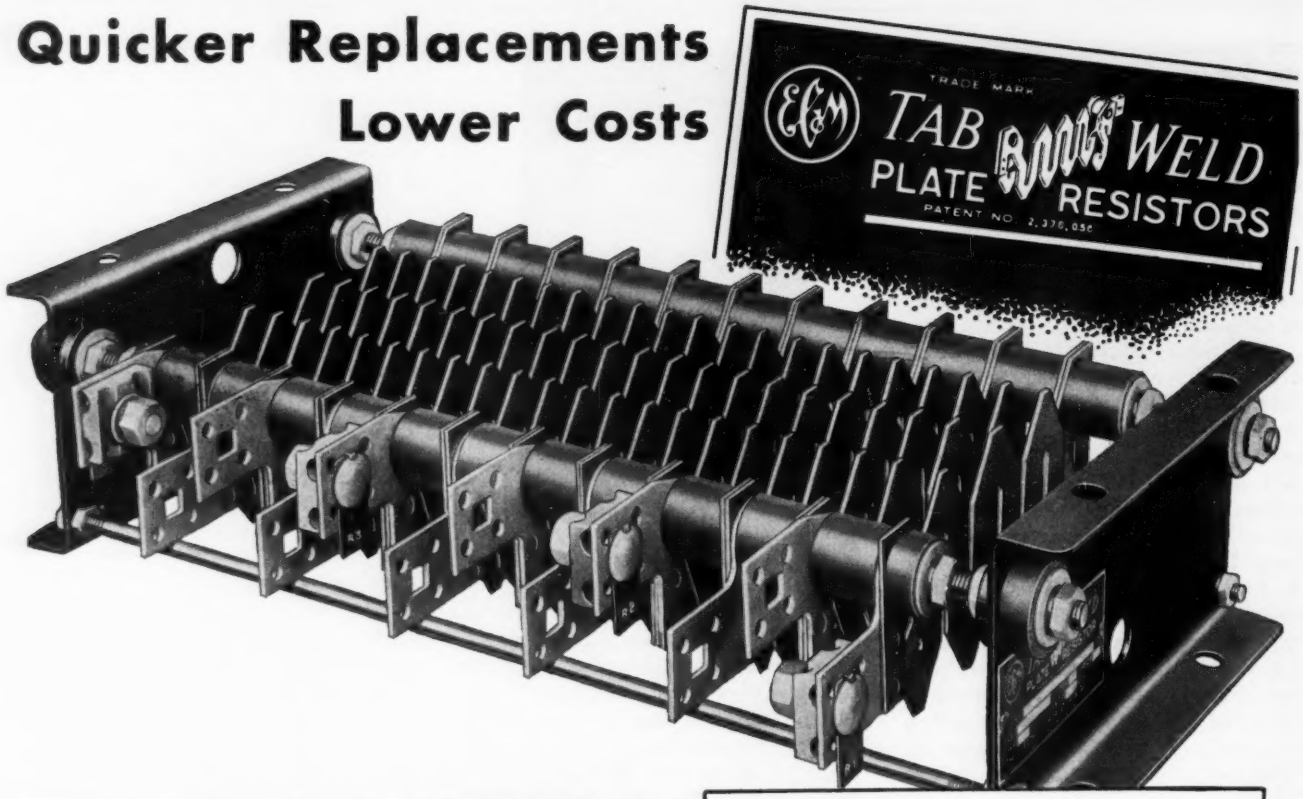
—o—

Robert B. Shearer, vice president and manager of the steel department, C. S. Mersick & Co., New Haven, Conn., died Oct. 16 after a short illness. He had been associated with the company for 53 years.

—o—

Lester B. Hamersley, 48, sales promotion manager, Firth-Sterling Steel & Carbide Corp., McKeesport, Pa., died Oct. 21.

Quicker Replacements Lower Costs



These Standard ASSEMBLIES Simplify the REPLACEMENT-PROGRAM

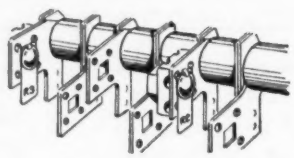
EC&M *Tab-Weld* Resistor sections for d-c crane and mill control have uniform mounting dimensions for *all* sections. Internally, each section has all grids of the same size, with grids connected in series.

Sections are rated with continuous current carrying capacities from 32 to 150 amperes, depending upon the size of grid per section. These mill sections, using nine different sizes of grids, require *no change — no shop alteration* when a field replacement is needed.

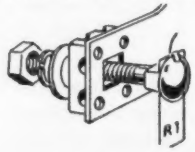
Convenient taps, resistance value stabilized by welding, shorten the replacement time. *Switch to EC&M Bulletin 942 Tab-Weld Plate Resistors.*

Each section complete with—

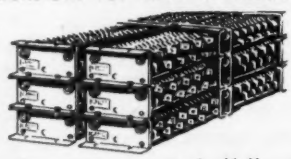
1—Suitable taps permanently in place at convenient points.



2—Terminal blocks with metal identification tag affixed to terminal bolts.



3—Uniform end - frame mounting hole dimensions for ease of stacking.



Use from storeroom shelf "as is."

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

Engineering News
. . . AT A GLANCE

CUTS DOWN SHOCK— A new molding powder for power tool handles and other applications that undergo rough treatment is reported to offer resistance to impact many times more than that of standard wood-flour filled phenolic materials. Discovered by General Electric's Pittsfield, Mass., plant, the compound can be molded into complex parts either by compression or transfer methods in molds designed for ordinary phenolics. Its inherent resiliency also permits it to be molded around complex inserts without cracking, and around inserts subject to flexing and vibration.

LIGHT DUTY FOR MECHANICAL "HEAVY"— Although the test machine unveiled recently at the Naval Experimental Station in Philadelphia's Navy yard is termed by the Navy as the largest in the world—5 million-pound capacity—it is slated for use in testing the lightest weight aluminum and magnesium structures that aeronautical engineers can design to meet severe requirements of modern flight. The Baldwin Locomotive-built, hydraulic machine is stated to accommodate specimens up to 30 feet high, 10 feet wide between columns and 50 feet long—subjecting them to high stresses in tension, compression or flexure. Its weighing system is so sensitive that loads as low as 5 pounds are indicated.

METAL "PASTE-UP" JOB— Effective method of reducing cost in the installation of sprinkler lines, lighting and other electrical services at the 400,000 square foot assembly plant now being completed for Perfection Stove Co., Cleveland, was provided by stud welding. Accurate control of welds by the method developed by Nelson Stud Welding Division, Morton-Gregory Corp., Lorain, O., made it possible to join special hanger rods to 18-gage steel without harming the panels, while confinement of welding flash also permitted the operations in presence of combustible materials. Lighting hangers were installed at the rate of 20 per hour with the special guns.

BOOSTS PRESS EFFICIENCY— Because of long runs possible on lamination dies with carbide inserts—one million pieces being considered minimum — press efficiencies are boosted importantly. A manufacturer in New Jersey, for example, runs a blanking press equipped with carbide dies for a full week, confining necessary maintenance over week-ends. Others doing similar work report ten times more pieces per 0.001-inch die wear on carbide. A film maker is studying possibilities of developing carbide punches and dies to perforate movie film. Work is done on small high-speed bench presses, piercing four holes on either side of the film at a time and in complete darkness. Exceptional precision is involved in grinding and assembling components of carbide dies for blanking and punching.

MECHANICAL "BRAIN"— Perfectly timed repetitive motions to multiple-ram installations utilizing hydraulic cylinders are provided by a mechanical "brain" currently manufactured by Hufford Machine Works Inc., Redondo Beach, Calif. Success of the unit depends on a series of specially designed cams which are machined for specific operations. In operation, the cams rotate and, in so doing, depress the roller bearing stems of actuating valves, thus permitting or cutting off the flow of hydraulic fluid operating the cylinders. Cams also can be altered for different actions, and the number employed is determined by number of cylinders to be controlled.

PERSONNEL "BRIEFER" — Information on tools in process is readily made available to interested personnel, from the time each is designed to the moment it is delivered, installed and placed in production, by a step-by-step control system devised by Reliance Electric & Engineering Co., Cleveland. According to the company, the setup provides an orderly flow of work at low cost. (p. 78)

A POINT MADE CLEAR—Fact that the new H specifications of ordering automotive steels allow a little wider range of analysis—so far as individual elements are concerned—has led to a misconception on the part of some users that these steels are not as closely controlled with regard to hardenability as the steels purchased under chemical analysis specifications. According to the SAE, this is not the case, for while the H specs do permit a wider range of analysis for individual elements, the summation of all hardening elements in the steel must be more closely controlled in order to produce a hardenability within the "H" band. (p. 81)

BLIND SUBSTITUTION BAD — In extending and promoting the use of aluminum, industry leaders are urging that attention be focused on areas in which the metal is definitely superior to traditional materials and can compete on a cost basis. Blind substitution, it is pointed out, often leads to general disappointment. Before substituting in any specific instance, appropriate studies of all important properties necessary in the finished product should be made. They should be made to determine whether those properties can be obtained directly with aluminum, or whether through design changes an even better product can be achieved with the lighter metal. (p. 84)

MINIMIZES MANUAL HANDLING —Fast internal plant handling coupled with the features of the new cold reduction mill and finishing facilities for flat rolled steel products in the Pittsburg, Calif., plant of Columbia Steel Co., is one of the factors aiding the company to meet the diverse needs of the West. In the tinning operations, for example, automatic feeding and electrolytic pickling of sheets at the tin stacks eliminate much manual handling and white pickling. (p. 100)

By FRANK S. DOBRIC
Chief Tool Engineer
Reliance Electric & Engineering Co.
Cleveland

Step-by-Step Control System

Procedure and forms used by Reliance Electric show status of new tool design and manufacture from time tool is requested until its delivery. System combines simplicity and flexibility while providing an immediate check at anytime on all work in process

. . . provides spot checks on tool design and manufacture

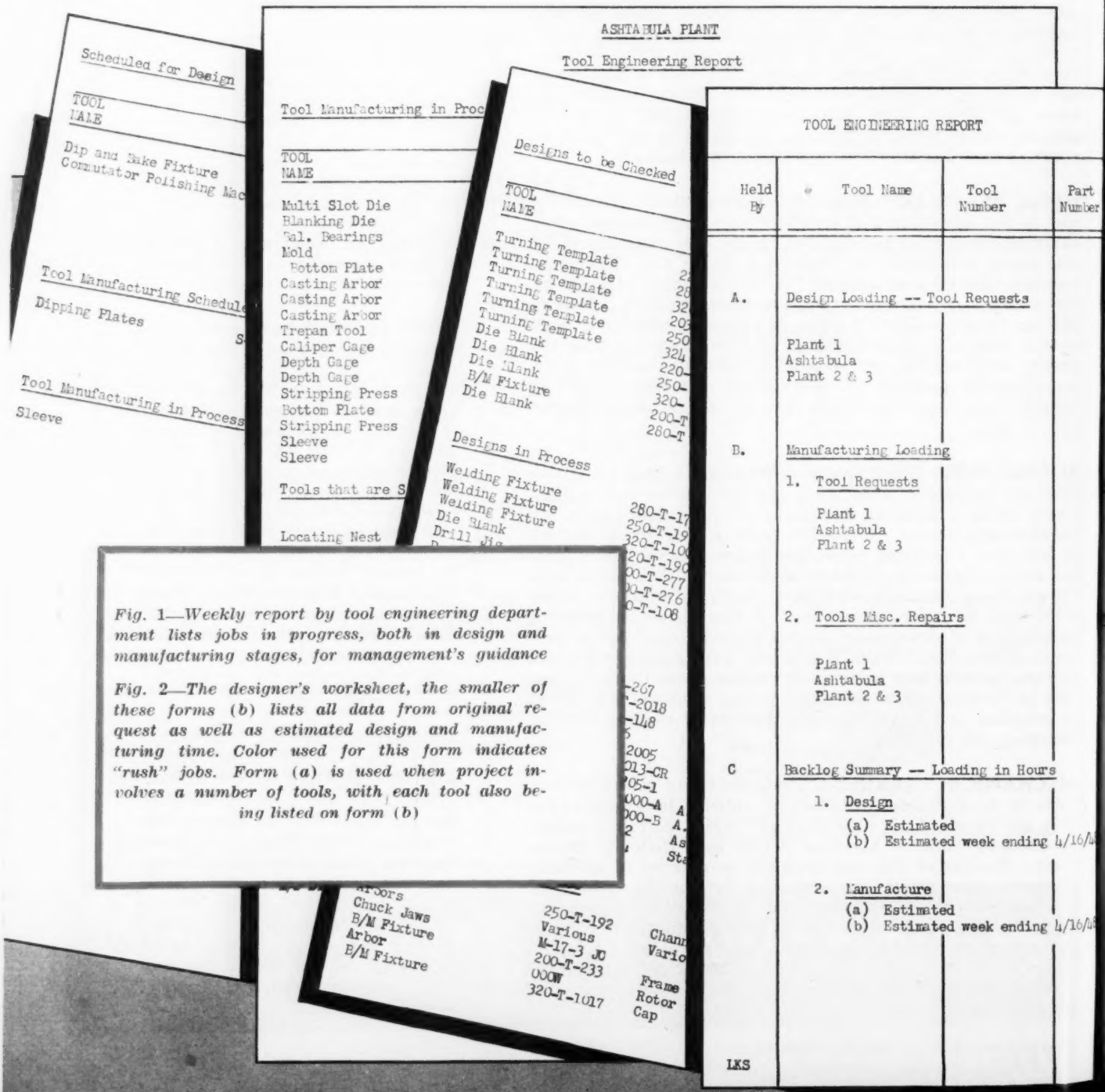


Fig. 1—Weekly report by tool engineering department lists jobs in progress, both in design and manufacturing stages, for management's guidance

Fig. 2—The designer's worksheet, the smaller of these forms (b) lists all data from original request as well as estimated design and manufacturing time. Color used for this form indicates "rush" jobs. Form (a) is used when project involves a number of tools, with each tool also being listed on form (b)

PRESENT huge demand for electrical motors of standard frame sizes and for such diversified specialized equipment as generators, motor-generators, gearmotors and adjustable-speed drives on a volume basis makes vital the tool engineers' task of designing and planning the manufacture of a wide range of tools, dies, jigs, fixtures and special-purpose machines, while holding to exacting quality standards and to closely prescribed time limits.

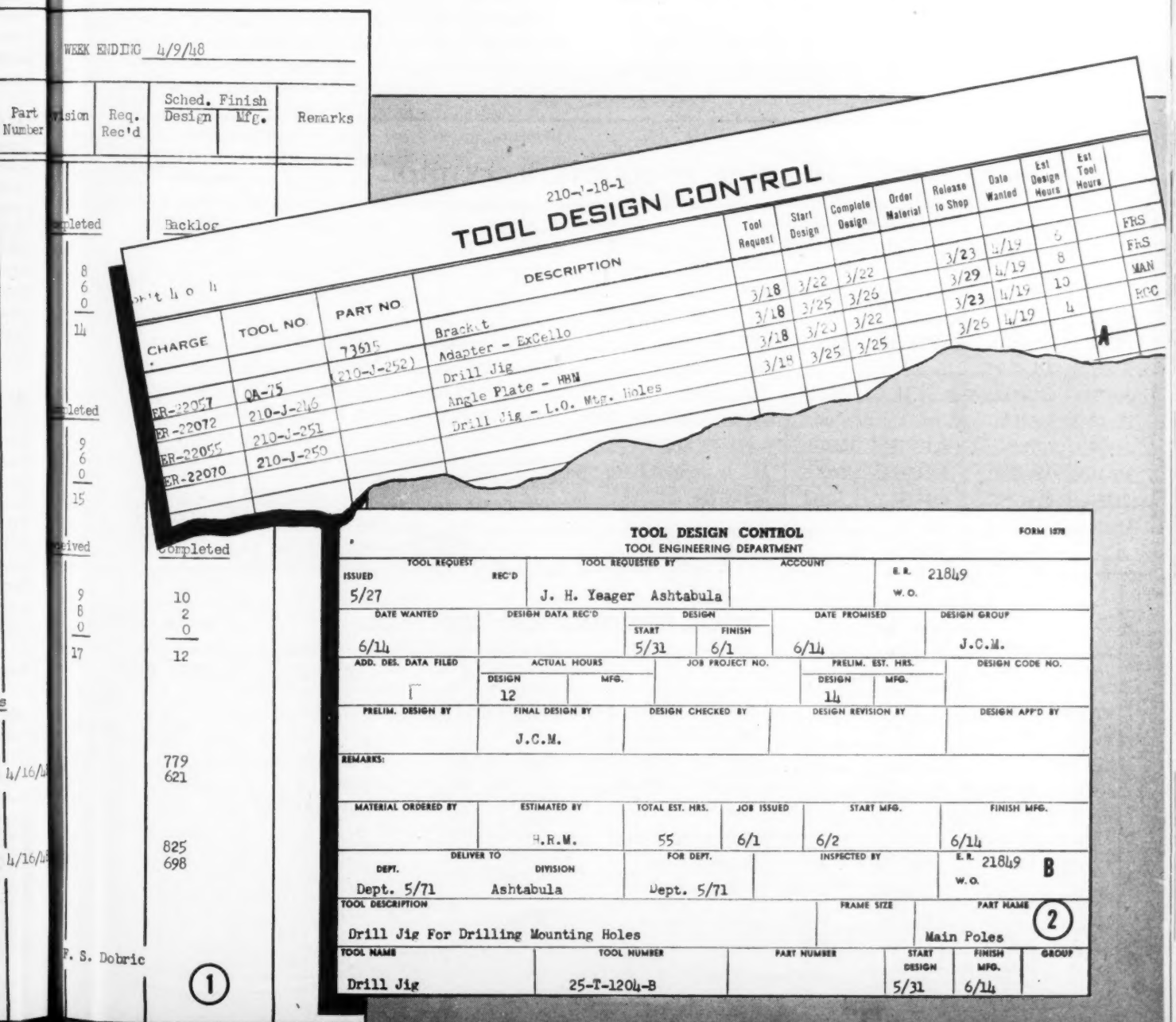
Ability of tool engineers to meet these stringent requirements is of fundamental importance if higher output, better quality and lower costs are to be obtained. These results can be achieved only through careful control of design and rigid inspection of completed tools.

Simplicity Stressed—Procedures followed and paper forms utilized must not only provide simplicity in use, but also afford certainty of results. They must fulfill these three essentials: (1) Provide flexibility in supervision to meet unexpected contingencies that may arise, (2) facilitate proper follow-up to "keep tabs" on jobs in progress and to make sure that completed tools are delivered for productive use on time as promised, and (3) minimize paperwork to save time and expedite routing of the design from the initial drawing to checking and installation of the finished tool or machine.

A system meeting these essentials has been evolved by Reliance Electric & Engineering Co. and as a result of its operation the company has effected an orderly flow of tool work at minimum cost. The system in practice, after several years' successful experience, is a flexible one which makes information on tools in process readily available to interested plant personnel from the time the request is received up to the moment when the finished tool is delivered, installed and put into production use.

Design, manufacture and inspection — the three basic functions in the provision of a tool—are performed in sequence after receipt of the request for or authorization of a specific tool by the process engineering department of any one of the company's four plants or by the tool engineers themselves.

Request Is First Form—Initial form in the system, then, is the "Tool Request," containing all essential data covering the specific type of tool desired. It



WEEK ENDING 4/9/48

Part Number	Req. Rec'd	Sched. Finish Design	Sched. Finish Mfg.	Remarks
				Backlog
				8 6 0 14
				9 6 0 15
				9 8 0 17 — Completed: 10 2 0 12
				779 621
				825 698

F. S. Dobric

(1)

210-J-18-1

TOOL DESIGN CONTROL

CHARGE	TOOL NO.	PART NO.	DESCRIPTION	Tool Request	Start Design	Complete Design	Order Material	Release to Shop	Date Wanted	Est Design Hours	Est Tool Hours	
		73615	Bracket									
ER-22057	QA-75	(210-J-252)	Adapter - ExCello	3/18	3/22	3/22		3/23	4/19	8		FHS
ER-22072	210-J-246		Drill Jig	3/18	3/25	3/26		3/29	4/19	8		FHS
ER-22055	210-J-251		Angle Plate - HHN	3/18	3/20	3/22		3/23	4/19	10		MAN
ER-22070	210-J-250		Drill Jig - L.O. Mtg. Holes	3/18	3/25	3/25		3/25	4/19	4		HCC
												A

TOOL DESIGN CONTROL — TOOL ENGINEERING DEPARTMENT — FORM 1578

TOOL REQUEST ISSUED	REC'D	TOOL REQUESTED BY	ACCOUNT	E.R. / W.O.
5/27		J. H. Yeager Ashtabula		E.R. 21849

DATE WANTED	DESIGN DATA REC'D	DESIGN START	DESIGN FINISH	DATE PROMISED	DESIGN GROUP
6/14		5/31	6/1	6/14	J.C.M.

ADD. DES. DATA FILED	ACTUAL HOURS DESIGN	ACTUAL HOURS MFG.	JOB PROJECT NO.	PRELIM. EST. HRS. DESIGN	PRELIM. EST. HRS. MFG.	DESIGN CODE NO.
	12			14		

PRELIM. DESIGN BY	FINAL DESIGN BY	DESIGN CHECKED BY	DESIGN REVISION BY	DESIGN APP'D BY
	J.C.M.			

REMARKS:

MATERIAL ORDERED BY	ESTIMATED BY	TOTAL EST. HRS.	JOB ISSUED	START MFG.	FINISH MFG.
	H.R.M.	55	6/1	6/2	6/14

DELIVER TO DEPT.	DELIVER TO DIVISION	FOR DEPT.	INSPECTED BY	E.R. / W.O.
Dept. 5/71	Ashtabula	Dept. 5/71		E.R. 21849 B

TOOL DESCRIPTION	FRAME SIZE	PART NAME
Drill Jig For Drilling Mounting Holes		Main Poles (2)

TOOL NAME	TOOL NUMBER	PART NUMBER	START DESIGN	FINISH MFG.	GROUP
Drill Jig	25-T-1204-B		5/31	6/14	

includes the tool name and number, quantity required initially and estimated annual maximum usage, department where it will be used, date wanted and date promised. Any unusual specifications required or peculiar conditions which must be met are briefly noted on the form.

After the need for a certain tool has been determined, all necessary design and manufacturing data is recorded on a special "Tool Design Control" (Fig. 2a) and "Tool Production Order" forms.

The control form contains the following: (1) Issue and receipt of tool request; (2) originating department; (3) account chargeable; (4) date desired and promised; (5) date of receipt of design data; (6) when design is started and completed; (7) group responsible for design; (8) hours for design and manufacture; (9) persons making preliminary and final design; (10) checking, revision and approval of design; (11) date of ordering material; (12) total estimated hours; (13) date job is issued; (14) dates manufacturing started and completed.

The second form—the tool production order—lists certain information outlined above, and in addition, provides for entry of essential production statistics. These include ordering of material, name of estimator, tool description, name, number and delivery data.

Prior to filling out these two forms, the design is scheduled, based on a loading chart, to permit completion of the tool on the requested date. When the loading chart indicates that the required dates cannot be met, a check is made with the process engineering department of the plant affected to secure a new date that will be acceptable. However, if a later date is not permissible, then other work already scheduled is retarded, the job put on an overtime basis, or the work is subcontracted.

Filed by Stage of Work—These two forms, when filled in, are filed in a "Schedule for Design" drawer of a filing cabinet containing a number of such drawers; jobs are filed by date so they will receive the attention required in relation to the urgency and delivery dates. From this step, jobs in progress go next to "Designs in Process" drawers. Tools in process of design are indicated when only the tool production order is in the file, the tool design control form having been removed for use as a work sheet by the tool designer.

After the design is made it receives a dimensional check. Following this, whatever special parts and material are required to (*Please turn to Page* 114)

Fig. 3—Progress of individual tools is reported on this form by the tool room so that original estimates may be checked and status of work verified

FORM 103 1M 4-47

FINISHED TOOLS

TOOL PRODUCTION CONTROL

WEEK OF 5/10/48

CHARGE	TOOL NO.	PART NO.	FRAME	DESCRIPTION	DATE ISSUED	DATE WANTED	EST. HRS.	HOURS COM'D	HOURS SCHED.	
21771	G-7202-Q	49410-5	320	Gage, Depth	3/12	4/1	6	2.5		Ash.
21770	G-7202-P	49409-5	280	Gage, Depth	3/12	4/1	6	2.5		Asht.
72/32	B-12-3			Notch Center, Repair	3/12	3/12	4	2.5		1
21782	46-J-26	43394-1	46-J	Line Up Gage	3/15	3/16	10	5/7		1
5/79/32	320-T-155			Regrind Die	3/6	3/9	15	9.0		Ash.
20974	200-T-2015-A		200	Tool Block	2/3	3/1	35	32.7		Ash.
WO-1577	S-1097			Carbide Tool Bit Blank	3/8	3/15	20	17.0		1
21739	K-78	All	440	Key, Die Cast	3/8	3/15	25	24.0		1
WO-1533	360-T-159	63215-1A	360	Set up Template Mtg. Holes	3/1	3/15	4	0		1
21756	81-T-504	47727-A	510-J	Drill Jig	3/11	3/15	25	16.3		1
WO-1560	25-T-828	All	All	Commutator Miller	3/1	3/12	40	23.0		
71/32	25-T-[illegible]	70610		[illegible]			13.5	11.5		1

FORM 103 1M 4-47 JOBS BEING WORKED ON JIGS & FIXTURES

TOOL PRODUCTION CONTROL

WEEK OF 5/10/48

CHARGE	TOOL NO.	PART NO.	FRAME	DESCRIPTION	DATE ISSUED	DATE WANTED	EST. HRS.	HOURS COM'D	HOURS SCHED.	
WO-1580	25-T-1223			Cyl. Sleeve for Motor Cast. Press	3/17	3/23	25	0		Graf
WO-276	SK-23191			Spin Test Machine	11/18	1/5	491.9	Total		Spinner
WO-1192				Die Cast Mold Posts	3/3	3/11	115	93.8		Anthony
20606	25-T-1196			Checking Fixture	11/19		530	504.9		Erzen
20349	25-T-5026			Tail Stock	2/19	2/27	75	50.9		Spinner
20944	25-T-1281		200-320	Stripping Press	2/9	3/22	500	898.1		Dvorak
20996	K-226	49435-ARA	320	Casting Keys	2/11	3/1	20	16.0		D. Forla
21633	G-6520	49409-5	C-280	Gage, Ring	2/25	3/28	20	6.0		Brant
21633	G-6421	49409-5	C-280	Gage, Ring	2/25	3/28	15	9.0		Brant
21634	G-6522	49408-6	250	Gage, Ring	2/25	3/28	20	5.0		Brant
21638	210-J-220	73306-3R	210-J	Checkin[illegible]	[illegible]/8	3/15	60	36.5		M. Forla

"H" Band HARDENABILITY SPECIFICATIONS

. . . favorably received by users of automotive alloy steels

SAE Iron and Steel Technical Committee reports good practical results after 3½-years' experience with SAE-AISI method of ordering steels by hardenability as well as by chemical analysis

ABOUT 3½ years ago the Society of Automotive Engineers and the American Iron and Steel Institute Technical Committee tentatively agreed upon a new method of ordering automotive alloy steels in accordance with hardenability as well as chemical analysis specifications. It was hoped that this method of ordering steel would give better control of the response to heat treatment, and assure better properties in finished automotive parts. Last fall the Hardenability Division of the SAE Iron and Steel Technical Committee conducted a survey of the automotive, tractor and aircraft industries, to determine the extent to which hardenability specifications were being used, and the results which were being obtained.

Three years ago only one manufacturer was using the new "H" band, or hardenability specifications. By last fall, however, 14 of the 27 companies replying to the questionnaire were using the new hardenability specifications and 8 more were using some sort of hardenability specifications. Only 5 did not incorporate any kind of hardenability requirements in their specifications.

On the whole, the answers to the questionnaire indicate that considerable improvement has been made in the elimination of the small percentage of heats, which are too low in hardenability to respond satisfactorily to production heat treatments. Distortion, warping, and cracking have been somewhat reduced. This may be due in part to reduction of maximum hardenability, however it is believed that the smaller variation in the hardenability of steel obtained from different producing sources is an important factor.

One user reported that the better minimum hardenability of the H steels permitted the use of less drastic quenching, which again reduced distortion and cracking. It has also been reported that the use of "H" specifications has reduced the number of changes in tempering temperature, which are necessary to keep the steel products within hardness specifications.

While no reports are available with regard to effect of hardenability control upon service performance, it is certain that the elimination of the very small per cent of steel which is inclined to result in low surface or cross sectional hardness, is a step in the right direction and might bring about some reduction in the per cent of service failures.

As a general rule, however, the per cent of service failures is very low. Consequently, it is difficult to arrive at a definite figure for the effect of hardenability control on service failures. Use of hardenability specifications does not change the average performance of steel parts, but it does eliminate the extremely high and extremely low hardenability heats of steel which formerly would have been accepted under chemical analysis specifications. In this way it reduces the small per cent of trouble which was previously experienced.

Hardenability vs Hardness—The hardest structure which can be produced with the most efficient quench is martensite, but the hardness of 100 per cent martensite varies with the carbon content of the steel; however, maximum hardness is not materially affected by the alloy content. Thus a 0.50 per cent carbon steel will attain a maximum hardness of rockwell C 63.5 while a 0.35 per cent carbon steel cannot be made harder than about rockwell C 57.5.

Speed of quenching required to produce 100 per cent martensite depends upon the "hardenability" of the steel, which in turn depends upon the total effect of hardening elements, such as carbon, manganese, silicon, nickel, chromium, molybdenum, vanadium, and boron, and upon the grain size and other characteristics of the steel. The higher the hardenability, the less drastic is the quench required to produce 100 per cent martensite.

Hardenability and Other Properties—It has long been recognized that there is a very close correlation between hardness over the cross section, and other physical properties, such as strength and toughness. There is a very definite relationship between tensile strength and hardness of a test specimen. Other physical properties, such as yield strength, ductility and toughness, depend at least in part upon the degree to which the steel was hardened before tempering, and the final hardness produced by quenching and tempering. (*Please turn to Page* 120)

Welding Stainless

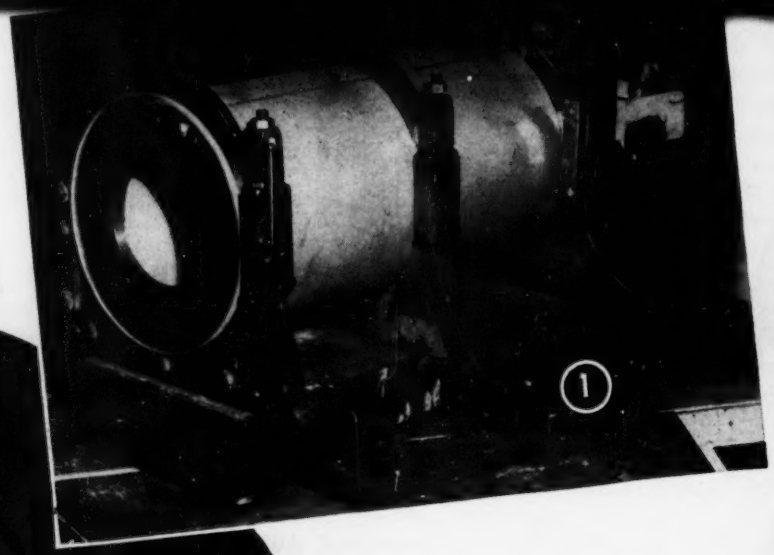


Fig. 1—Shell aligned in special jig for tacking operation. Tacks are spaced ¾-inch apart along length of seam. No filler rod is used

Fig. 2—Welding operator completing finish weld

Fig. 3—View of underside of a completed weld, with stock of completed shells in the background. Handle is made from mild steel, chrome-plated

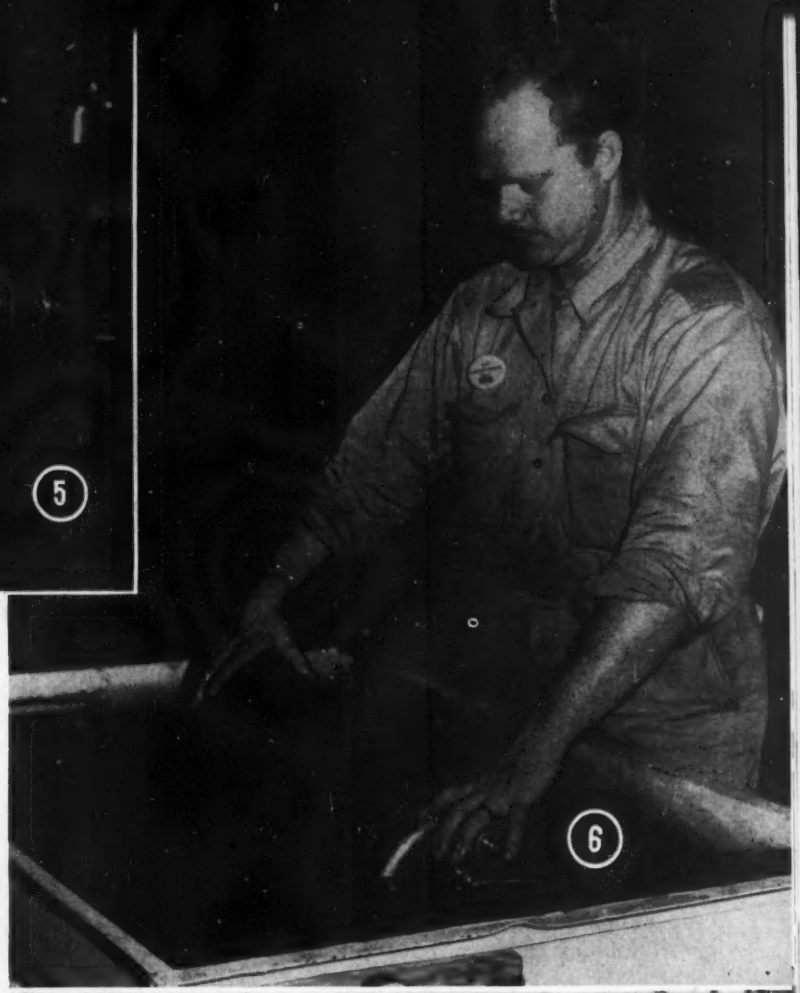
Fig. 4—Heads with stainless steel connector fittings which are welded on the inside of the head as shown. Large opening in head is provided for cleaning and filling vessel

Fig. 5—View of welding operation on girth seams

Fig. 6—Testing vessel for leaks

Fig. 7—Inside back view of drink-dispensing machine. The three vessels may be filled with same type syrup, or each one may be filled with a different syrup. Machine is fitted with a refrigeration unit and a small pump to boost water pressure within machine

Fig. 8—End view of vessel with filling hole cover in place. Top and bottom view of cover plate shown

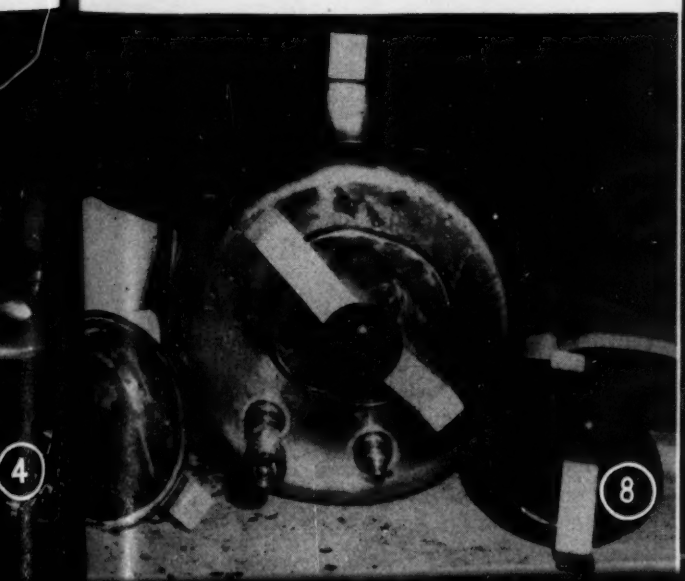


Containers

. . . by inert-gas shielded arc process

STAINLESS steel tanks to hold soft drink syrup in automatic dispensing machines are being fabricated by the Heliarc inert-gas-shielded arc welding process at the Dallas, Tex., plant of Texas Engineering & Mfg. Co. Tested to 50 pounds per square inch air pressure, the vessel is 18½-inches long, 9 inches outside diameter; the 347 stainless shell is 1/16-inch thick and the head 3/32-inch thick. Average welding speed on the longitudinal and girth seams is 6 inches per minute, using a 1/16-inch diameter electrode.

Accompanying photographs, courtesy The Linde Air Products Co., New York, show fabricating and final testing operations.



New Uses Expand Aluminum Casting Applications

By FLOYD A. LEWIS
Technical Consultant
Aluminum Association
New York

Production of primary aluminum reached billion pound mark in 1947. Increase in castings of 15 per cent recorded over previous year. New alloys and production procedures extend range of potentially practical applications

APPLICATIONS of aluminum in all various forms in which it is available have expanded tremendously in the postwar years. Hundreds of new uses were added during 1947, bringing the total number of different uses to well over the 4000 mark. In addition, usage in many previously developed applications has increased markedly. To meet the increased demand, production of primary aluminum in 1947 exceeded the billion-pound mark for the first time since 1944.

Aluminum castings have followed the same general pattern. The 1947 production of castings totaled some 450,000,000 pounds, more than 15 per cent above the 1946 production. Casting production during 1948 is expected to be considerably above that for 1947.

Several factors have had a significant influence on the rapidly expanding usage of this versatile lightweight metal. First, many men who became familiar with aluminum and its unparalleled record of achievement during the war years are now applying it to their peacetime products. Second, new alloys and production procedures developed during the war have greatly extended the range of potentially practical applications. This is particularly true of the aluminum foundry industry. Production facilities were greatly expanded and existing facilities were modernized to enable the industry to meet the prodigious wartime demand for castings. As a result, foundries are now equipped to produce more and better castings of a wider variety.

Economical Material—Another factor in the expanding use of aluminum has been the shortage of other materials, particularly castings. In many cases, there has been no other reason for the substitution of aluminum for some other material. In other cases, aluminum has been found to be distinctly superior to some of the more traditional materials. These uses undoubtedly will continue so long as they remain economically attractive. And in spite of generally spiraling prices on practically all materials and products, the price of aluminum was 30 per cent higher in 1939 than it is now.

In extending the use of aluminum, industry leaders are urging that attention be focused on areas in which aluminum is definitely superior to other materials and can compete on a cost basis. Blind substitution often leads to general disappointment. Before substituting aluminum in any specific instance, appropriate studies of all important properties necessary in the finished product should be made in order to determine whether those properties can be obtained directly with aluminum, or whether through design changes an even better product can be achieved with the lighter metal.

Outstanding Qualities—Light weight, high electrical and thermal conductivity, excellent resitance to corrosion, desirable combinations of mechanical properties, workability, and ease of applying attractive surface finishes are the outstanding characteristics that place aluminum and its alloys at the top of the list for many casting applications. To these may be added the high strength developed in some of the more recently introduced alloys, especially by heat treatment, which has considerably broadened the range of aluminum casting applications.

Ease with which aluminum castings can be machined and finished has not been thoroughly evaluated in all instances. This is an important factor in these days of high labor costs.

In many respects, the design of an aluminum casting is similar to that required for other metals. Full benefits usually are realized however, only by carefully adapting the design to take full advantage of the unique properties of the lighter metal. Consultation with an experienced aluminum foundryman will pay dividends in this consideration. By bringing his intimate knowledge of the metal and its properties to bear on the problem, he often can make suggestions that would not occur to one accustomed to handling other metals. (Throughout this article, when the term "aluminum" is used in a general sense it is intended to embrace the entire series of alloys in which aluminum is the predominating element.)

Commercial Alloys—Considering the endless possibilities of alloying other elements with aluminum, it is somewhat surprising to find that less than 100

Fig. 2—Examples of permanent mold castings. Photo courtesy Permold Co., Medina, O.

Fig. 1—Subassembly of aluminum pistons and connecting rods for small general purpose gasoline engines. Photo courtesy D. W. Onan & Sons Inc., Minneapolis

alloys are in commercial use today. Of these, some 30 are in regular use for sand and permanent mold casting. Perhaps less than 10 different alloys are filling the vast majority of needs where extremely high strength or other special requirements are not involved.

Early alloys contained only one other element besides aluminum, copper being the first to be added. Later silicon was added to the aluminum-copper alloys, which still later led to a binary aluminum-silicon series. Still later, magnesium was alloyed with aluminum to provide both high strength and high resistance to corrosion.

Alloy Use Extended—As the alloying characteristics of other elements were studied and knowledge of their behavior accumulated, more complex alloys were introduced. In many instances the newer, more complex alloys with their improved properties and casting characteristics replaced the older, simpler alloys for many applications. In other cases the newer alloys extended the usefulness of aluminum into entirely new fields. This is particularly true of the alloys most recently introduced.

There is considerable overlapping of mechanical properties among the various alloys.[1, 2] This simplifies the selection of an alloy for a specific purpose, for once the mechanical requirements are known final selection can be made on the basis of other properties such as casting characteristics, resistance to corrosion, electrical or thermal conductivity or resistance to abrasion.

Hard metal inserts often are used in aluminum castings at points subject to excessive wear or stress. These are usually cast iron or steel, but copper or brass also may be used. Keyed inserts are sometimes used where high torque must be transmitted to a rotating aluminum part.

Commercially pure aluminum has a specific gravity of 2.71. Specific gravity of various casting alloys varies but little from this value, and for practical purposes all these alloys may be considered to weigh one-tenth of a pound per cubic inch. This compares with 0.26 pound per cubic inch for cast iron. Castings of essentially pure aluminum have an electrical conductivity of about 56 per cent of that of the international annealed copper standard, and a thermal conductivity of 0.51 in centimeter-gram-second units at a temperature of 25° C. Both properties have lower values in the alloys, the former ranging down to about 18 per cent and the latter to about 0.18 in centimeter-gram-second units.

Surface Finishes — Perhaps no other commonly used metal offers as broad a range of surface finishes as aluminum.[3] For many purposes, of course, no special surface treatment is needed, for the metal has an attractive appearance which suffers little change under a wide variety of service conditions. Where the plain aluminum surface does not provide the desired qualities a large number of easily applied finishes is available, ranging from the purely utilitarian to the highly decorative. They are applied by mechanical, chemical, or electrochemical means, depending on the required surface characteristics and the desired appearance.

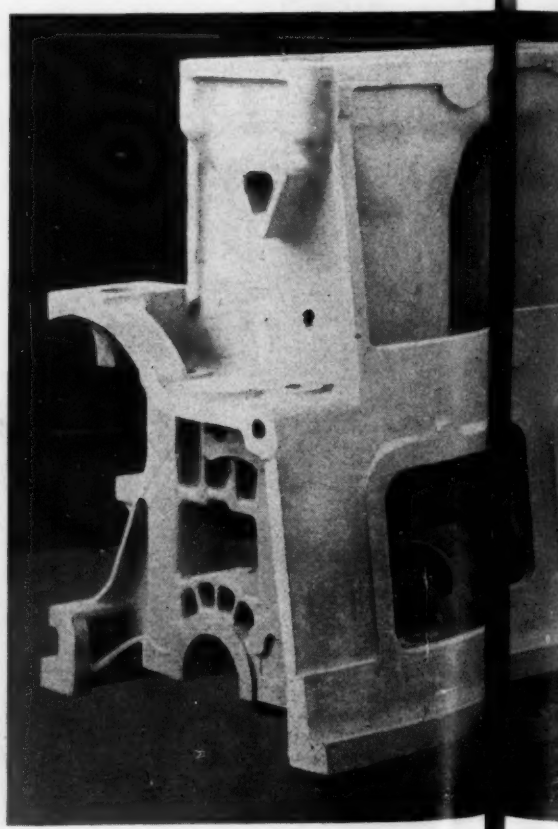
Oxide coatings applied by anodic electrochemical treatment are perhaps the most versatile of all the various finishes available for aluminum. These coatings have a hard smooth surface and are resistant to atmospheric corrosion, wear, and chemical attack. They may be impregnated with a variety of dyes or pigments to produce a variety of colors. Paint, lacquer, or enamel sometimes provide the most economical means of obtaining the required decorative or protective effect.

Applications of Alloys—Most of the applications using large quantities of castings fall into one of the following broad groups:

1. Transportation equipment of all types—air, land, and marine.
2. Internal-combustion engines for all purposes.
3. Household appliances, including cooking utensils, vacuum cleaners, mixers, washing machines, electric irons, and ironers, refrigerators, gas ranges, and others.
4. Architectural applications, including spandrels, plaques, gratings, grilles, and hardware.
5. Industrial equipment, including machine tools (especially portable); chemical equipment where high resistance to corrosion is required; dairy and food-production equipment; and agricultural equipment.
6. Electrical equipment, including current-carrying parts for which controlled compositions of essentially pure aluminum are used.

In addition to these broad general clasifications, there are many more specialized and unusual applications.

To discuss or even mention all of the applications of aluminum castings would obviously be far beyond



the scope of one article. Therefore, only typical classes of applications and a selected group of the more specialized and unusual uses are discussed. From these, many potential users can easily visualize how aluminum castings can be effectively applied to their own products.

Transportation Uses — Aluminum's outstanding characteristics perhaps come more completely into play in the field of transportation equipment than in any other. Its lighter weight means higher pay loads, better performance, and lower operating costs. Its high thermal conductivity combined with its light weight makes it particularly adaptable for use in internal-combustion engines. Its nonrusting characteristics give it long life under severe exposure conditions.

General-purpose alloys CS22 and SC8 ordinarily are used for such parts as flywheel housings, crankcases, gear housings, and fuel-pump bodies. Where improved strength and resistance to impact is required, such as for wheels and structural parts; alloys C1 and CS4 are used. For more complicated parts and those requiring pressure tightness in addition to good strength, alloys SC21 and SG1 are useful. Alloy SC42 is normally a less-expensive alternate for the latter two. Alloy G3 has been used successfully for high-strength structural parts of aircraft and for railroad passenger-car seat frames, but is not recommended where operating temperatures may exceed 200 F. Alloys S1, G1, and GS1 are highly resistant to corrosion by salt water and salt-laden atmospheres, and have therefore found application in the marine field.

Needless to say, use of aluminum in aircraft will continue. Although the bulk of this is in sheet or other wrought forms, aluminum castings are used in many vital parts, especially in the engines and the accessories. This is true also of other applications in the transportation field, castings being used mainly in the engines, accessories, and fittings, but some structural parts also are being cast in aluminum.

Automobile Industry Applications — Although the aluminum automobile still seems a long way off, there are many uses in modern cars and usage is expanding. The automotive industry consumed approximately 100 million pounds in 1947, and experts in the field expect that amount to be tripled in

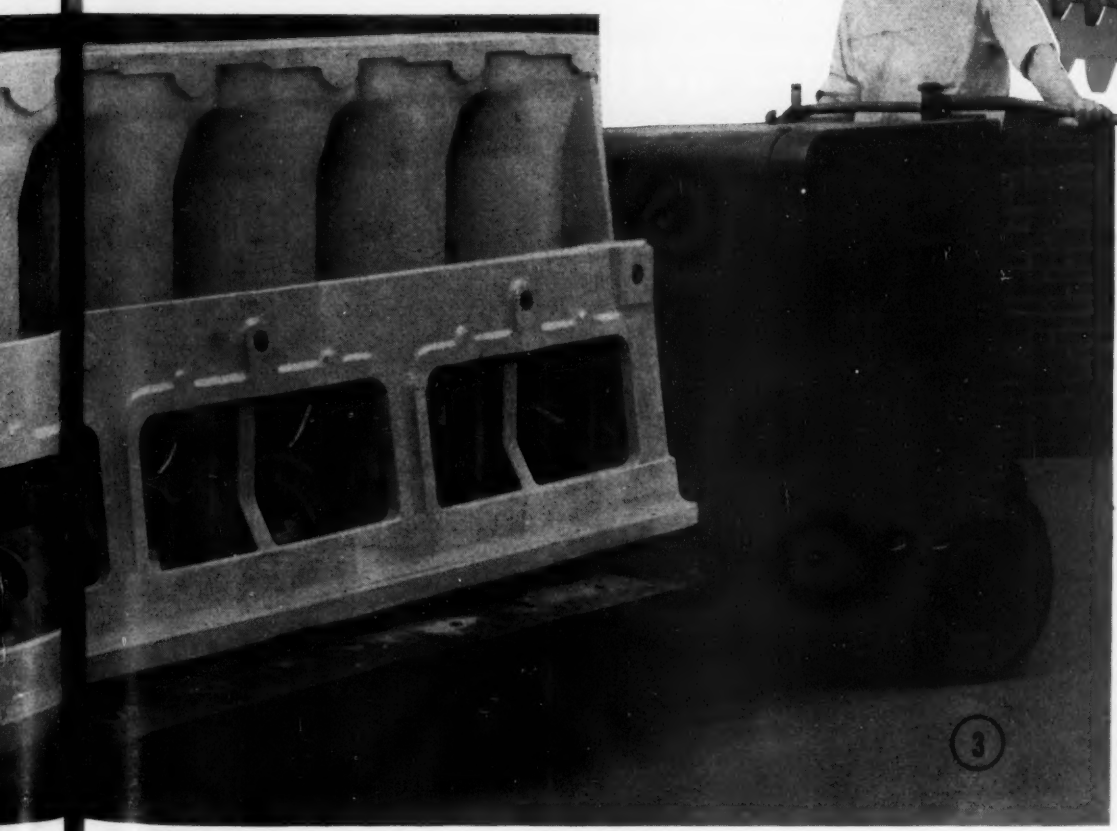
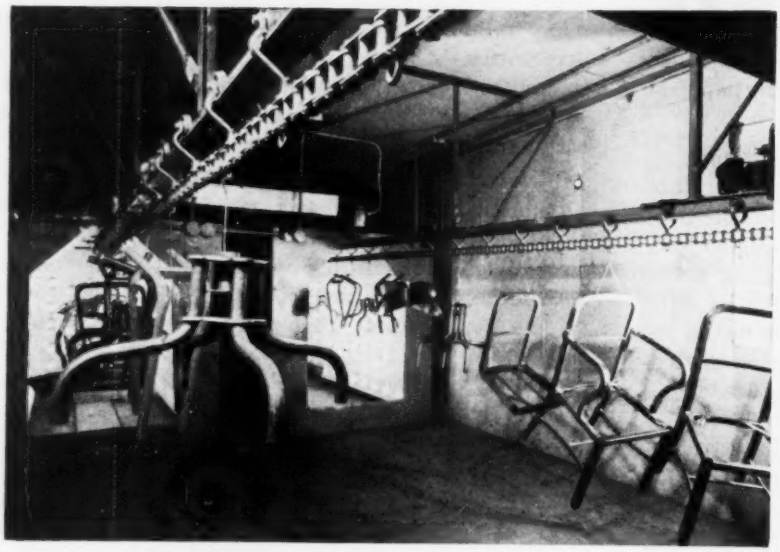


Fig. 3 — Aluminum diesel engine casting. Photo courtesy Bohn Aluminum & Brass Corp., Detroit

Fig. 4—Cast aluminum automotive timing gear with bonded-in steel hub. Photo courtesy Fairchild Engine & Airplane Corp., New York



LOOP AROUND CONVEYOR: An unused coal bin was used for the installation of an infra-red oven and an overhead loop-around conveyor manufactured by Jensen Specialties Inc., Detroit, in baking prime and finish coats on various types of metal chairs in the plant of Sturgis Posture Chair Co., Sturgis, Mich. A total of three hundred 250-watt lamps are used for a total load of of 75 kilowatts. Conveyor speed was initially set at 6 feet per minute

1948. One manufacturer estimates the usage in 1948 as high as 100 pounds of aluminum per car. A significant portion of this will be in the form of castings.

Aluminum castings are being used for many engine parts, hydraulic-brake pistons, oil-pump bodies, timing gears, clutch housings, carburetor parts, and distributor gears. Among the newer cast aluminum parts are windsheld frames and intake manifolds. One manufacturer recently introduced the torque converter to the passenger automibile field, a device that has been used for some time in trucks and buses. This unit consists almost entirely of aluminum castings, and its use is expected to extend to other makes in the near future.

Truck and Trailer Wheels—Cast aluminum truck and trailer wheels are now being manufactured on a production basis by a prominent permanent mold foundry and their use is steadily increasing. Wheels are cast from alloy SC 8 and are heat treated. A 20-inch spoke type wheel weighs only 32.6 pounds and complete aluminum wheel assembly weighs 135 pounds.

In both the railroad and marine fields, the most outstanding applications of aluminum have been in sheet or other wrought forms. Aluminum castings, however, comprise important units in both fields, including trucks and underframing of railroad cars. In steam locomotives the most notable aluminum reciprocating part is the crosshead slipper, others are side rods and valve gear. Reduced weight of these rapidly moving parts reduces "rail hammer" and lengthens the life of both the locomotive and roadbed.

In the marine field, aluminum castings are found mostly in fittings, valves, accessories and deck machinery. During the war cast-aluminum treads and step plates with an abrasive embedded right in the metal were used on many naval vessels.

Internal-Combustion Engines — In all classes of transportation equipment internal-combustion engines of all types have made generous use of aluminum castings for years. Here both light weight and high thermal conductivity are important qualities. Aluminum pistons are used almost universally in all types of engines. Other cast aluminum parts are used to a widely varying extent in engines of many types.

During World War II, thousands of air-cooled engines were produced with aluminum cylinders, cylinder heads, and crankcases. Aluminum cylinder heads for liquid-cooled engines also were made in large numbers, as were other parts such as carburetor bodies.

Piston Requirements — In addition to the necessity of retaining their strength at elevated temperatures, alloys to be suitable for pistons must have good wear resistance and low coefficient of thermal expansion. Alloys CN21, CS23, and SN41 are the leading piston alloys, the latter having the lowest coefficient of thermal expansion. All are suitable for the permanent-mold casting process which is the method used almost universally for pistons. A modification of alloy SN41 recently introduced by Aluminum Company of America (alloy D 132) also is being used extensively for pistons. Alloy SC41 is an alternate for alloy SN41 but it does not have as high mechanical properties at elevated temperatures. Both SC41 and D132 are normally slightly less expensive than SN41.

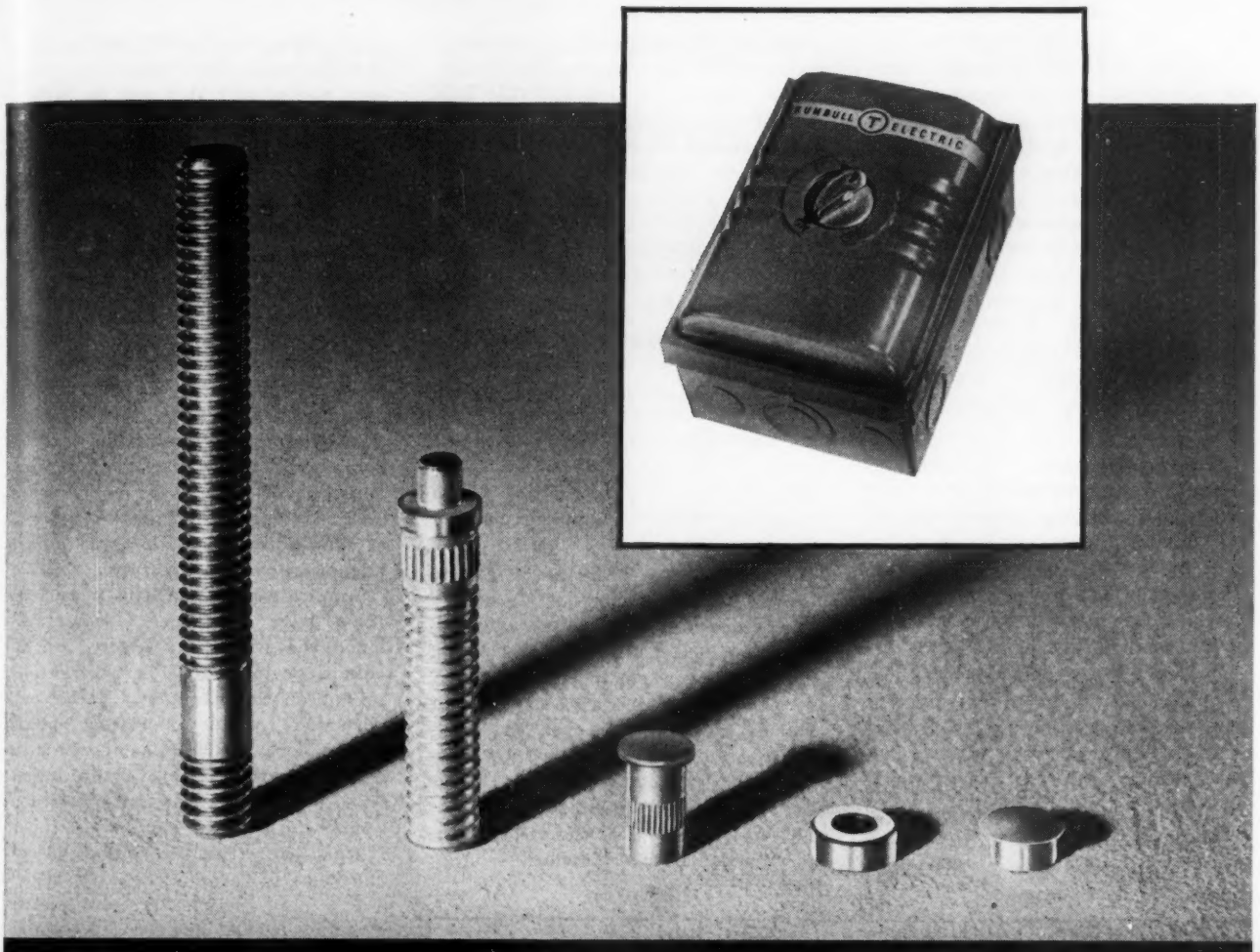
Alloy CN21 has been used extensively for aircooled cylinder heads and alloys CS22 and SC21, which have excellent pressure-tightness characteristics for liquid cooled heads. Alloy CS22 also is used for crankcases, oil pans and transmission cases.

Portable engines for farm and other uses are being built using aluminum castings for most of the major components. One such engine developing 10 horsepower weighs only 97 pounds, although considerably higher horsepower to weight ratios are obtained in aircraft, outboard marine and other special purpose engines. Aluminum castings are also extensively used in motorcycle and motor scooter engines, where high output with minimum weight is essential.

Lightweight Diesels — Lightweight, high-speed compact diesel engines employing aluminum castings for major components were built in large numbers during the war. Their success has led to increasing use of such engines in railroad, marine, truck and bus fields. It is estimated that engines of this type now being built utilize from 3 to 3-1/2 pounds of aluminum per horsepower. Aluminum castings are being used in these engines for cylinder heads, pistons, cylinder blocks and jackets, crankcases, gear covers, flywheel housings, superchargers, connecting rods, crankpin boxes, frames, bearings and many smaller parts.

Introduction of a number of alloys for bearings of internal combustion engines is one of the more recent developments in aluminum alloys.[4] These contain 6.5 per cent tin and smaller percentages of other elements. They have been used mainly in heavy duty service, mostly in the diesel field.

Composite aluminum-steel and aluminum-iron parts are now being used to some extent in the transportation



A CASE HISTORY SHOWING THAT

REVERE FREE-CUTTING COPPER SAVES MONEY

IF your product requires machined copper parts, it will pay you to investigate savings in machining costs made possible by Revere Free-Cutting Copper Rod. We would suggest that you make trial runs of this metal to prove what it will do under your own shop conditions. That was the procedure followed by The Trumbull Electric Mfg. Co., Plainville, Conn., with these results:

Part #18107 and 18108, contacts for the Type D switch illustrated, were designed around this alloy. Trumbull states: "On both these parts we found we could make them in one operation instead of two. That is, due to the smooth free cutting of the metal, it was unnecessary to perform a facing operation . . . Our screw machine foreman advises that, in his opinion, both these parts could be made four times as fast as out of ordinary electrolytic copper rod."

#3731, 60 amp. post stud.—5,760 pieces run in 19.6 hours with no machine down-time; 10,425 pieces of ordinary copper rod run in 66.6 hours with 11.8 hours machine down-time. In addition to the extra time required, three sets of dies were used for the regular rod. "The savings of the free-cutting material over ordinary copper were figured at $1.81 per thousand, including in these costs both material and direct labor."

#16552, space washer. "Savings per thousand over electrolytic copper were 77¢. This figure included the material difference and direct labor. In addition, there was an 18% saving in machine down-time."

#K-60-1A, 70-200 amp. stud. "The use of Free-Cutting Copper Rod on this part very definitely increased production and practically voided machine down-time."

In a letter to Revere, Trumbull added: "In general, at least for most of the parts we have used, we find that there is at least a 25% saving in machine time of free-cutting over regular copper. In addition, the workers are enthusiastic about this material, particularly when running studs, because of the fact that it is no longer necessary for them to keep a constant close watch on the machine to see that the turnings do not become tangled up with the moving parts of the machine."

The Trumbull experience is being duplicated in other machine shops. If you have not tried this Revere Metal, we suggest you get in touch with your nearest Revere Sales Office.

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field. Developed originally for the production of aluminum-finned cylinder barrels for aircraft engines, process consists essentially of casting aluminum alloy against a steel or iron core or backing with a specially prepared surface.5. An intimate bond is formed between the two metals. Because of the differences in coefficients of thermal expansion, not all alloys of the two metals can be used in this way. It is found that alloys C1, S1, SC21 and CN21 can be successfully bonded to plain, alloy and stainless steel and also to cast iron.

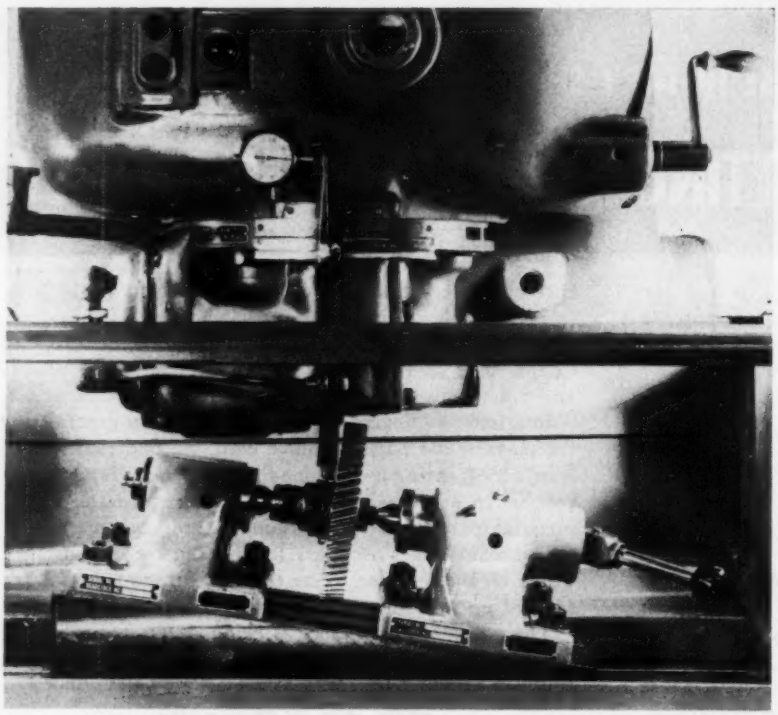
Building Products — Large usage of sheet, extrusions, and other wrought products is largely responsible for the building industry's leading the field in tonnage of aluminum used during the past 2 years. However, castings are used to a considerable extent in buildings of all types.

Cast aluminum spandrels have been used successfully in commercial and public buildings for many years. Gratings, grilles, decorative plaques and a variety of statuary also are produced in cast aluminum.

Alloy S1 is used for the majority of spandrels and other decorative castings. It has excellent resistance to corrosion and casting characteristics. Alloys G1, GS1 and GZ1 also are used, especially where the finish after anodic electrochemical treatment must match that of adjacent wrought aluminum parts, but the casting qualities are not as good as those of alloy S1. Where higher strength is needed, heat treated castings of alloy SG1 are often used.

Electrical Equipment — Aluminum rotor bars in induction motors have been used for many years. More recently the rotor bars, collector rings, and cooling fans have been cast in one piece. These are produced by a special pressure casting method which casts the entire assembly in place in the rotor slots.

For current carrying parts, closely controlled compositions of essentially pure aluminum are used where maximum conductivity is necessary. When slightly lower conductivity is permissable, the addition of 1.5 per cent silicon material improves the casting characteristics. Where low conductivity is required, other alloys are available with conductivities as low as 18 per cent of the international annealed copper standard.



SLANT SHAVING: Decreased machining time results from using a conical involute cutter and tipping the work away from it for shaving shoulder gears. This new method of shaving was developed by National Broach & Machine Co., Detroit, and is applicable to spur and helical gears or teeth which are tapered away from or toward the shoulder gear. The operation illustrated has a clearance of only ⅛- inch between work gear and larger gear

Aluminum wire, cable, and bus bars are being used more extensively than ever before and this use is rapidly expanding. Cast aluminum fittings and connectors are being produced for these conductors. Aluminum conduit also has come into more extensive use recently, and cast fittings, outlets and switch boxes, and other accessories are being made.

Machine Tools — Because of its light weight, aluminum is particularly useful in machine tools and industrial equipment in general. In portable drills, grinders, saws and similar hand tools, aluminum castings have come to be used almost universally for the major components. Reduced worker fatigue as a result of the lighter weight is the principal advantage.

Applications in stationary machine tools have broadened considerably since the war, particularly for accessories which must be handled both on and off the machines. Better performance, higher operating speeds, and reduced maintenance are the principal advantages gained where aluminum is used for moving parts, because of their low inertia.

One interesting machine tool application is turret heads for lathes. Other uses include structural parts, hand wheels and sheaves, cover plates, dividing heads, arbor supports and various other types of enclosures of which gear cases are typical. Such parts not only lighten floor loads in buildings where the machines are installed, but they are also a boon to maintenance personnel who must remove and handle such parts when repairs become necessary.

There are many more successful applications of aluminum castings in the foregoing and other fields. Uses discussed, however, indicate the types of applications wherein aluminum and aluminum alloys have been most useful.

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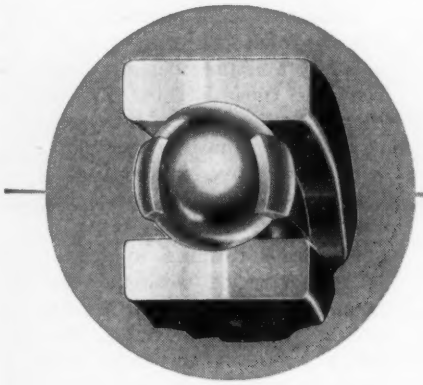
Heavy duty water cooled holder ideally suited for production work but equally capable of being used for any general purpose jobs within the range of inert gas shielded arc welding is being manufactured by Air Reduction Sales Co., New York. Exterior of holder itself is all plastic.

YOU CAN SEE THE DIFFERENCE

IN HOOVER HONED RACEWAYS

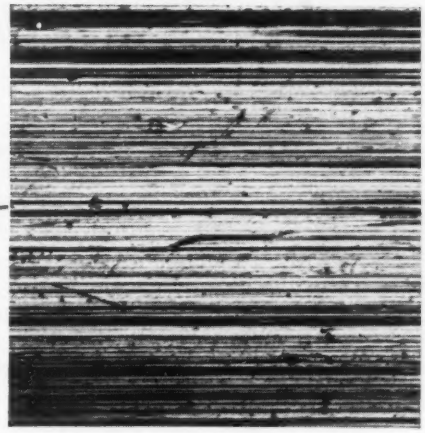
The photographs reproduced at the right are magnified one hundred times, so that you can see the difference between ground, polished and honed raceways. Hoover is America's only ball bearing with honed raceways. The process and the special machines for the honing operation, are exclusive, patented, Hoover developments. Hoover honing goes far beyond grinding and polishing to produce a surface that represents the closest approach to absolute perfection obtainable on a commercial basis.



Honed Raceway Features

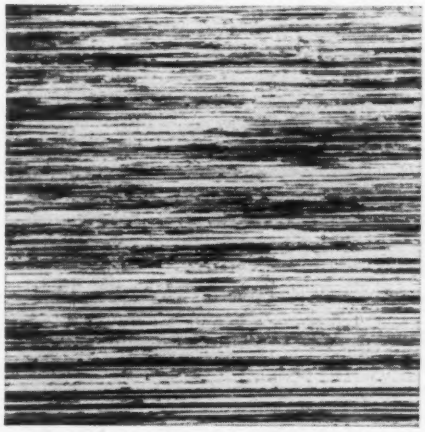
Summed up Hoover honing provides the following results . . .

1. Extreme quietness.
2. Increased load capacity.
3. Extended life.
4. Reduced end play (axial displacement).
5. Reduced radial displacement.
6. Permanence of fit up.
7. Increased resistance to Brinneling.
8. Uniformity of fit up.
9. Freedom from vibration.
10. Perfection of dynamic balance.



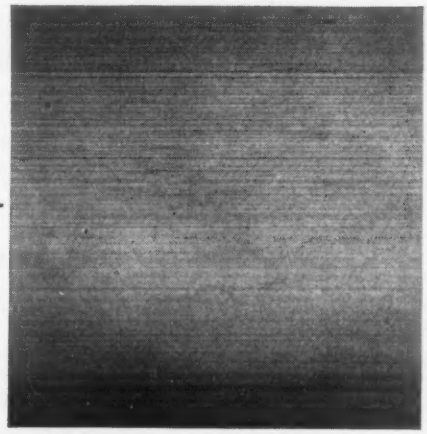
GROUND RACEWAY SURFACE
(Photographed at 100 Magnifications)

This precision ground surface is satisfactory for many types of precision products and for low-speed thrust bearings. Not suitable for high speed radial bearings demanding smoothness, quietness, long life and high load capacity.



POLISHED RACEWAY SURFACE
(Photographed at 100 Magnifications)

Adding polishing operation improves on ground surface. But increased smoothness and quietness is achieved at expense of shortening bearing life and decreasing load capacity because polishing does not permit raceway radius to be held within sufficiently close precision limits to insure uniformity.



HONED RACEWAY SURFACE
(Photographed at 100 Magnifications)

Photo-micrograph illustrates how cuts and scratches resulting from grinding and polishing are reduced to practically non-existence by Hoover honing process. This patented Hoover process achieves bearings equal to super-fine laboratory specimens, at a price you can afford to pay.

THE ARISTOCRAT OF BEARINGS

HOOVER "AMERICA'S ONLY BALL BEARING WITH HONED RACEWAYS"
HOOVER BALL AND BEARING CO., ANN ARBOR, MICHIGAN

Greater Forming Efficiency

PROVIDED BY NEW PROCESS

FORMING of steel gas cylinders, upsetting sections of tubing to increase wall thickness, sealing tube ends, necking-down tube sections and other high-production operations of a related nature on low-carbon or alloy steel, brass and other metals may be performed with greater efficiency by a process utilizing a combination of electrical current and pressure, it is reported by Federal Machine & Welder Co., Warren, O.

Now available to users, the Westin process—developed by the Westin brothers—is said to result in considerable savings in time and material, provides improved quality, and outperforms conventional methods.

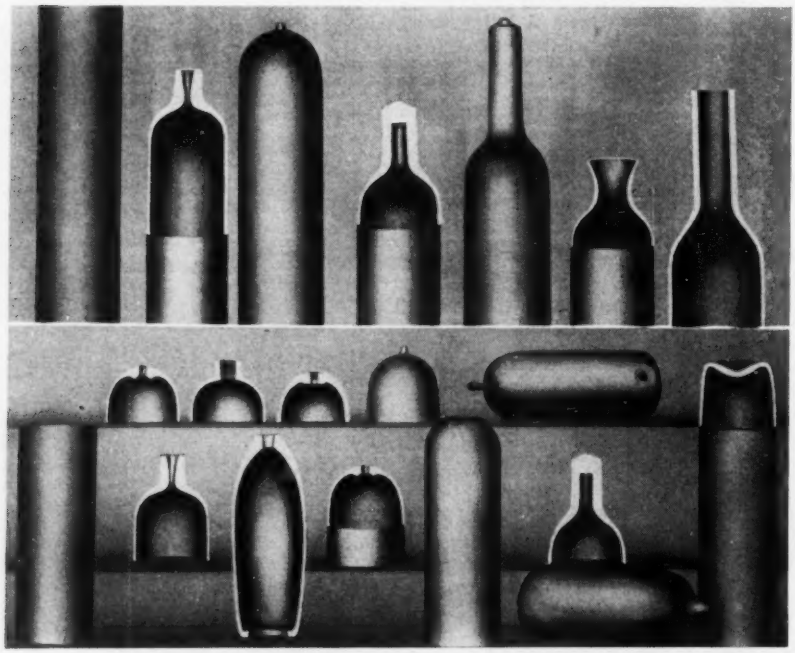
Machines for forming by means of this process consist of a heating transformer, dies, mechanism for holding and rotating the tube, and either a means of feeding the tube into a split cavity die, or a means of feeding the two die segments at right angles to the axis of the tube.

The two halves of the split die are insulated from each other, and one side of the die is connected to one side of the heating transformer. The opposite half of the die is connected to the other side of the heating transformer. The tube on which the forming operation is to be performed is secured in the chuck and simultaneously rotated at low speed and fed into the die cavity by either mechanical or hydraulic means. As the tube enters the die, the current flows from one die segment through the tube and back through the other die segment. The electrical resistance of the tube to the flow of current causes it to heat rapidly in the die, and as the tube is fed into the die it is progressively heated and formed to the shape and diameter of the die cavity.

Some extruding operations on tubing are also possible by using the dies in the manner described above to heat the tube (without rotation) in the sections which are to be extruded, then forcing the tube through a die, which will give a longitudinal extruded section on the inside and outside diameter of the tube.

On some forming applications it is necessary to construct the machine so that the segments of the die can be fed in against the tube, but the principle is the same. That is, the current flows through the die segment into the tube and as the two parts of the die are fed in at right angles to the axis of the tube, the section of the rotating tube in contact with the die is progressively heated and formed to the contour of the dies.

Various operations that may be performed on tubing by new process



Data Sheet Describes Zinc Alloy Properties

Contained in the data sheet on Eraydo alloy, produced by Illinois Zinc Co., Chicago, are a description of the metal, its properties, uses, advantages and its workability. The alloy, produced from high grade zinc to which copper and other strengthening metals are added, is a solid metal which reportedly requires no painting or plating to protect it from deterioration.

Among the uses of the alloy are corrugated roofing and siding sheets, flashings, ventilating louvers, home appliances, rolled sections and gutters and downspouts. It can be formed with sheet metal tools, it is said, and can be drawn, rolled and spun. Industrial finishes can be applied after priming and it may be readily soldered.

Punch Press Strap Weld-Repaired in 4 Hours

Faced with an 8 to 12 week shutdown of a punch press while a new part was obtained, one company reportedly successfully repaired the part in 4 hours time, using EutecRod 16FC ready flux coated (for lowest heat applications) electrodes, made by Eutectic Welding Alloys Corp., New York. The break in the part, a strap on the press, was caused by a hidden flaw in its internal section.

The strap was removed from the press and the break V-ed out to a 90 degree angle, then preheated in a blacksmith forge to 600° F. Approximately 5 pounds of the ⅛-inch electrode was required the fill the cavity. The casting was then returned to the forge and covered with hot ashes overnight. The strap was then reinstalled and has been in daily service since.

—o—

Handling time and costs have been slashed, and a safe method of stacking gaseous and explosive materials to ceiling height to conserve storage space has been provided at Eli Lilly Co., Indianapolis, by using fork lift trucks made by Towmotor Corp., Cleveland. Trucks operate 16 and 24 hours a day handling more than 3000 kinds of materials and products.

Product-Proved Sheets..

PREFERRED BY MANUFACTURERS AND FABRICATORS

Manufacturers and fabricators who insist on steel sheets that combine workability with proved quality have found in the Continental line just the *right* sheet for each specific requirement.

The ability of the various types of Continental sheets to withstand difficult forming operations . . . to provide longer product life . . . proves the importance of using one of these familiar trademarked Continental sheets.

These are the sheets preferred by many companies for their highest quality products: Continental KONIK, a sheet which combines open hearth steel with copper, nickel and chromium to produce one of the finest, most economical sheets you can buy; Continental GALVANNEALED, a special quality sheet possessing a matte-like surface which "takes" and "holds" paint and fine finishes without the need of costly preparatory treatments; Continental DULL-COAT, another sheet with a zinc coating which provides a tight bond for paints, enamels and lacquers; Continental COPPER STEEL sheets, noted for their extra resistance to rust and corrosion, and for their workability; Continental GALVANIZED, a sheet with a zinc coating that withstands difficult forming operations without flaking or peeling; and Continental ELECTRICAL sheets which are made especially for manufacturers of electrical equipment. Write for special descriptive folder.

CONTINENTAL STEEL CORP. COPPER NICKEL CHROMIUM KONIK METAL KOKOMO, IND.
CONTINENTAL STEEL CORP. STEEL Galvannealed SHEETS KOKOMO, IND.
CONTINENTAL STEEL CORP. COPPER Dull-Coat STEEL KOKOMO, IND.
CONTINENTAL STEEL CORP. Copper Steel KOKOMO, IND.
CONTINENTAL STEEL CORP. STEEL CONTINENTAL SHEETS KOKOMO, IND.
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CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF STEEL SHEETS, including Continental GALVANIZED, COPPER-STEEL Galvanized, KONIK steel sheets Galvanized, UNIFORM SPANGLE Galvanized, DULL COAT, Continental GALVANNEALED, ELECTRICAL, Hot Rolled Pickled, and many styles of Formed Roofing.

ALSO, Manufacturer's Wire in many sizes, shapes, tempers, and finishes, Continental Chain Link Fence, Nails, and other steel products.

WIREMAKERS

Evaluate Mill Practice

Production control, carbide dies, building ventilation, drawing compounds, mill scheduling and wire rope are widely discussed at annual meeting in Pittsburgh. New ozone producing machine to obviate the use of inhibitors in pickling solutions. Next year's meeting to be held in Chicago

SHOULD our nation engage in warfare we will have to react in 60 days instead of four or five months and every arm of the land, sea and air forces will have to swing into action to the fullest extent. This opinion was voiced by Col. Malcomb Hay, Infantry-Reserve U.S.A. in addressing members and guests at a luncheon of the Wire Association which held its annual meeting at the William Penn Hotel, Pittsburgh, Oct. 18-22. In reviewing the essentials of the nation Col. Hay declared there is need for strong and healthy population, co-ordinated intelligence force, a scientific research program, industrial mobilization and stockpiling, and regular armed forces.

Next year's annual meeting of the Wire Association will be held at the LaSalle Hotel, Chicago, Oct. 17-21. The Canadian committee of the association announced its first sectional meeting to be held at the Mt. Royal Hotel, Montreal, April 28-29, 1949.

A report of the various technical papers presented at this year's meeting of the Wire Association follows:

E. L. H. Bastian, Staff Engineer, Shell Oil Co., New York, in speaking on drawing compounds stated that a lubricant designed for maximum friction reduction is the best in rod breakdown operation or in drawing a wire that does not require a high finish such as welding rod.

New types of continuous high-speed machines for heavier rod and wire are coming into wider use particularly in the nonferrous drawing field.

Essentially three classes of lubricant are used in the drawing of both ferrous and nonferrous wire. These include dry soap compounds which usually are employed in single hole or two and three draft machines on ferrous wire of heavy gage. In high-speed wire drawing, wet-wire methods are used, since dry soap in high die temperatures would char and be useless. 2. Wet wire solution or emulsions made by mixing compounds, usually paste, with water in various concentrations. 3. Drawing oils, representing various types of compounded mineral oils and other fluids, are being increasingly used for drawing such metals as stainless steel and aluminum. This is a relatively new field but growing rapidly based on industry demand for stainless steel and aluminum wire. For drawing these metals the most promising results at the moment are obtained with oil type fluids.

Some types of active cutting oils, containing fats or fatty acids have been used satisfactorily for drawing heavy stainless wire at low speeds. Recently the replacement of a water emulsion with drawing oil in a machine using diamond dies resulted in a 20 per cent better surface finish and much improved die life.

Aluminum wire drawing is coming into increased prominence in many mills. The drawing operation is performed on the same equipment as used for copper and brass wire and in many cases at comparable speeds for given wire size.

Two suggestions for handling material in the wire mill and concerning ventilation and fume control were offered by W. G. Imhoff, President, Wallace G. Imhoff Co., Los Angeles, namely, a unit closed system for equipment which gives off heat, fumes or gases, and a building which has been engineered for the elimination of fumes. He cited one concern which greatly reduced accidents by instituting a short rest period during which milk was supplied to the workmen. He pointed out that wood still is an ideal material for use in the pickling room and as a means for exhausting the fumes. Hoods built of this material and brought down low over the furnaces and pots form practically an effective closed system.

W. Parkin, President, W. M. Parkin Co., Pittsburgh announced that a new machine for the production of ozone has been developed and will eliminate the use of inhibitors.

E. T. Miller, Die Surface Engineer, Firth Sterling Steel & Carbide Corp., McKeesport, Pa., mentioned carbide dies has replaced steel and cast-iron die plates almost completely. Their use, he explained, has resulted in almost a 3-fold increase in drawing speeds up to more than 1500 feet per minute on ferrous metals and considerably higher on nonferrous metals, additional advantages being greater accuracy, longer life, improved finish on the product and more economical use, because carbide dies are much easier to recut and maintain.

Present wire drawing practice involves up to 38 per cent reduction on low carbon and from 25 to 30 per cent for high-carbon or spring wire. Drawing or reduction angle ranges from 14 to 18° for low-carbon wire and is reduced to about 12° for high-carbon or rope wire.

Mr. Miller warned that recutting beyond the maximum recommended hole size in an endeavor to utilize the carbide wall thickness which must be otherwise scrapped, is impractical. With a short nib, he asserted, the entrance and reduction angles become too wide in trying to make room for a larger entering size, and the draw pull and back pressure become too great. Excessive power consumption may result as well as the possibility of impairing the finish of the drawn product, due to the formation of slivers from over crowding in the reduction zone, and thus result in nib or wire breakage. He drew attention to the fact that too short a nib causes the bell to become too shallow for the proper lubrication and guiding of the wire into the die.

New high nibs afford room for the most efficient drawing angle in the reduction zone, the speaker pointed out, and its height permits a cored back relief based on the maximum recommended hole size. For this reason, he explained, there is no need to touch the relief as the die is recut successively to the maximum hole size. This feature by itself saves many hours in the user's die room. In recutting a die to a larger size, the speaker recommended that the reduction angle first be recut to accommodate the next larger wire size to be drawn. The bearing then can be enlarged from the back of the die to the corresponding size of the drawn wire.

Mr. Miller, in conclusion, said that in his experience the die does not break up in the bell, but in the reduction angle, and he emphasized that his company has increased the nib cautiously without removing the reduction bearing up into the die.

J. G. Weiss, Superintendent, Patent and High Carbon Wire Department, Keystone Steel & Wire Co., Peoria, Ill. in speaking on the Control and Production of High-Carbon Wire em-

phasized that the drawing of green or unpatented rods often causes trouble in subsequent processing, due to frequent rupture of either the surface or internal structures. He declared that patenting makes the structure uniform, ductile, and highly plastic so that it lends itself well to cold work for drawing operations.

Natural gas in his opinion produces a more uniform temperature throughout the furnace, is cleaner, operates with much less maintenance and is economical. A highly oxidizing atmosphere is maintained in the larger furnaces to purposely produce a heavy scale which is then cracked off by mechanical bending. After the rod or wire passes over the scale breakers, the surface is comparatively clean and free of scale. The normal steel loss caused by this heavy scaling is about 1½ per cent, Mr. Weiss stated. This loss, however, is offset by lower cleaning costs since this material can be cleaned quickly and much more economically than if it had a thin or adherent surface scale which is impervious to the action of cleaning acids.

The speaker drew attention to the more recently developed methods of processing, particularly the electrical resistance patenting machine, and mentioned that the wire is quickly heated by an electrical charge and quenched in lead, at any desired temperature. With this type of patenting a highly ductile and refined structure is produced and because there is practically no scale on the surface, the material is cleaned easily. The wire may be galvanized without any intermittent cleaning other than the usual muriatic acid bath used in galvanizing operations.

Permitting rods to stop in the furnace for more than a few seconds is poor practice. If such stoppage occurs, the speaker declared, the section at the exit end of the furnace which has cooled too slowly will have variations in the structure of the wire at this point.

The speaker suggested the use of water-cooled dies and blocks in order to dissipate the heat generated during the drawing operation. This cooling, he explained, is absolutely essential if the highest quality wire is to be finished at the indicated speeds, and especially is this true where uniformity and close tolerances are required.

A progressive buildup of heat occurs within the coil that seriously affects physical properties when drawing wire 0.120 and larger on large single blocks even though they are water cooled, according to Mr. Weiss. He drew attention to the fact that this nonuniform condition within the coil can be overcome by blowing a blast of air on the wire during the drawing operation, or by passing it through cold running water immediately after it emerges from the die. In his opinion, the latter process is the most effective for rapid dispersion of the heat.

Mr. Weiss mentioned that over an average of two years, the cost of electric patenting was twice as much as with gas-fired furnaces. Oil-firing patenting costs 5½ times as much as electric patenting. He pointed out that the cost of operation is higher because of power costs and that because of the necessity of having to run only wires of the same size at any one time there was a considerable loss in production and an increase in scrap which arose from changing from one size wire to another.

A paper on "Evaluation of Pickling Inhibitors from the Standpoint of Hydrogen Embrittlement" by C. A. Zapffe, consulting metallurgist and M. E. Haslem, research chemist, Baltimore, Md., disclosed that the presence of commercial pickling inhibitors in the pickling solution did not reduce embrittlement of steel wire of the type 440-C. Instead, Mr. Zapffe stated, these reagents often made the embrittlement much worse than that resulting from pickling in raw acid. While the behavior of these several reagents differed, no one of the half dozen tested improved pickling brittleness.

As a further check on disclosures, the authors employed two additional grades of stainless steel, namely type 410 and 431, in their research. Pickling these grades in raw acid caused no measurable embrittlement, yet they found that the addition of an inhibitor initiates measurable embrittlement.

Of more than a dozen inhibitors employed in the investigation, eleven caused greater embrittlement by their presence in the acid than that caused by pickling in the raw acid itself. It was also found that two of the inhibitors neither increased nor decreased the degree of embrittlement caused by the pickling in uninhibited acid. Mr. Zapffe was of the opinion that since these results are accompanied by a customary great decrease in metal attack, and therefore in total hydrogen produced, they must be based upon a great increase in the proportionality factor for hydrogen dissolving in the metal versus total hydrogen produced. This, he explained, is a matter of subtle surface chemistry and is not yet understood.

In his concluding remarks, Mr. Zapffe announced that two preliminary compositions for special inhibitors had been derived which points the way to correcting the problem of pickling brittleness with susceptible stainless steels. The speaker also was of the opinion that hydrogen free steel may eliminate many breakage problems in the wire industry, although he stated that it will be a problem to obtain this class of steel because of the hydrogen pickup from the mold wash and furnace atmospheres.

A paper on "Wire Drawing Research in the British Iron & Research Association," by W. C. Hessenberg, British Iron & Steel Research Association, London, was pre-

Unveiling of a grandfather's clock—a gift to the Wire Association by its British members in appreciation for the manifold courtesies extended to them—was a feature of the Wednesday afternoon session. The presentation was made by John Rigby, chairman, John Rigby Co. Ltd., Low Moor, Bradford, England.

The 8-foot mahogany case was made in 1770. The movement operates for 400 days without rewinding and it is the plan of the British members to send a representative to each annual meeting of the Wire Association to rewind the clock.

The "anniversary clock" is operated by a 40-pound weight and is 13 times more efficient than a common 8-day long case clock. The pinion train has a gearing ratio of 34,560:1. The hand-engraved dial has a motto reminding that time can neither be kept nor destroyed. In the arch is a rotating sphere moon showing the phasing of the moon around which a hand points out the age of this luminary. The matted dial center is relieved by a segment of a circle on which are pointed out the number of days which have elapsed since the clock was wound.

The clock will be installed in the offices of the Wire Association, Stamford, Conn.

sented by G. K. Rylands, Rylands Brothers Ltd., England. The author dwelt at some length on the process of back pull for reactive wire drawing. He said the most important thing about the use of this particular method of drawing is the fact that the load of the die is reduced. Claim is made that the process reduces the die load as well as the frictional drawing forces, a small power saving is effected, die life is prolonged, and there is less heating of the wire. The speaker raised the question as to whether any of these advantages is large enough to be of commercial significance.

Mr. Rylands also presented the paper "Wear Resistance of Wire for Wire Ropes" by R. S. Brown, Chief Metallurgist, Rylands Brothers Ltd., Warrington, England. One of the matters of importance brought out by this paper was that when high-carbon steel is raised to a temperature above the transformation point and then rapidly quenched, martensite is formed as a brittle, hard, constituent. The author mentioned that for many years several haulage rope failures have been attributed to the formation of a substantial film of martensite on the worn flat surfaces of the outer wires. He went on to explain that because of the extreme brittleness of this film it is impossible for the wire to be bent without the surface fracturing.

Close Relationship Exists

Resistance to plastic flow is directly related to the tensile strength of the wire. The author asserted that plastic wear in wire ropes is bound to consist of the production of a severely cold worked film which may be exceedingly brittle, depending upon the nature of the wire manufacturing process. He expressed the opinion that this surface layer is continuously removed and replaced under the action of a wearing influence and the process is one of attrition taking place in a severely embrittled film. The so-called work hardened films differ substantially from those mentioned in his report. They consist of a hard, brittle, martensite produced by frictional heat and where they occur, rapid destruction of the rope follows. Mr. Brown maintained that a careful selection of the wire manufacturing process in relation to the conditions of usage of wire ropes is desirable if the maximum service is to be obtained from them.

At the Wire Association luncheon, Wednesday afternoon, C. L. McGowan, Superintendent Wire Mill, Atlantic Steel Co., Atlanta, Ga., presented the Mordica memorial lecture, his paper covering details of early wire drawing practice in the United States. In the early days of wire-making in this country, Mr. McGowan related that one stack of rods in the yard served as raw material for all wire and wire products. Pickling tubs were made of wood and the steam in the pickle room made it impossible to see across the floor. Speed of early wire drawing blocks was about 400 feet per minute whereas today it is possible to draw 200 tons of wire through the carbide die.

Explains Martensite Formation

J. H. Corson, Research Engineer, John A. Roebling's Sons Co., Trenton, N. J., in speaking on "Formation and Properties of Martensite on the Surface of Rope Wire" explained that martensite only occurs in the wire crowns of a rope in service and is associated with abrasion in which frictional heat is generated. If the abrasion is insufficient to cause an increase in temperature above the lower critical point, martensite cannot form. He declared that if a thin layer of metal on a rope wire crown is heated above the upper critical temperature that full martensitic hardness will be attained upon cooling. He expressed the belief that the formation is solely dependent upon the temperature to which the surface is increased by friction and not at all affected by the method of manufacture or the chemical analysis within the range of 0.40 to 0.85 per cent carbon rope wire steels. Any differences in the service life under conditions where martensite is present, he stated, are solely dependent of the properties of the martensite.

Mr. Corson presented data to show that the higher carbon martensite cracks on bending depending on the severity of bending and the carbon content. He pointed out that steel rope wire of 0.55 per cent carbon and lower tearing rather than cracking occurs in the martensite and that these steels require considerable more bending than those of higher carbon content.

Tests, described by the author, suggest that where service conditions tend to form martensite, the damaging effect of it can be reduced by lowering the carbon content. If the carbon content is 0.55 per cent or lower, the author asserted that the danger of broken wire from martensite formation is greatly reduced.

N. T. Nelson, Jr., Industrial Engineer, Rod & Wire Mills, Bethlehem Steel Co., Sparrows Point, Md., in speaking on "Quality, Quantity and Service", predicted that wire mill men are entering into a new era. The mill which makes good wire and gets it into the hands of the customer late is going to lose out in the long run. Uncoated wire is perishable and must be gotten into the point of consumption as quickly as possible. He stressed the importance of getting the finished wire into the plant of the customer on the day the shipment was promised. By methodically expediting the product in the wire mill from one station to another there will be no occasion for backlogs.

The speaker described a method of getting materials to the plant which he termed loading control and by this means of control he made it plain that it is possible to predict six weeks in advance whether or not an overload occurs in the annealing, patenting or any other section.

When an underload exists, the speaker declared, the sales department is advised of this condition and is requested not to sell this particular type wire until further notice.

Importance of Mill Loading

If the mill at any time is improperly loaded, only part of the order will be ready, and this may involve less carload lot shipments with corresponding higher freight rate and because of this situation, the mill may have to stand the added expense. Where the mill is dealing with an order for different sizes of wire and if the wire is not properly loaded according to size ranges, it may be impossible to get out the coarse sizes. Whenever this is the case, only part of the order is ready and the remainder lags behind.

The speaker related that the effort with scheduling over a period of two years at his particular mill has penetrated parctically to every man at the machine. Because of this, the workmen eventually realizes that what he makes today is to be shipped to the customer the next day and that unless this occurs the man in the consumer's plant will not be able to get a day's work. This picture has had a definite, livening and quickening effect on the men in our mill and they have been brought to the full realization that giving a good day's work will count for something to the man the next day in a shop miles distant.

One of the key men in the wire mill today is the product provider. The speaker explained that each provider is charged with the responsibility for causing material to flow to his product on a weekly or daily basis from the next previous operation. He tallys the production and shipment of his product. He may be required to cause materials to flow through his operation for use in filling orders of the provider in the next finishing department down the line, however his main responsibility is for his own shipping products.

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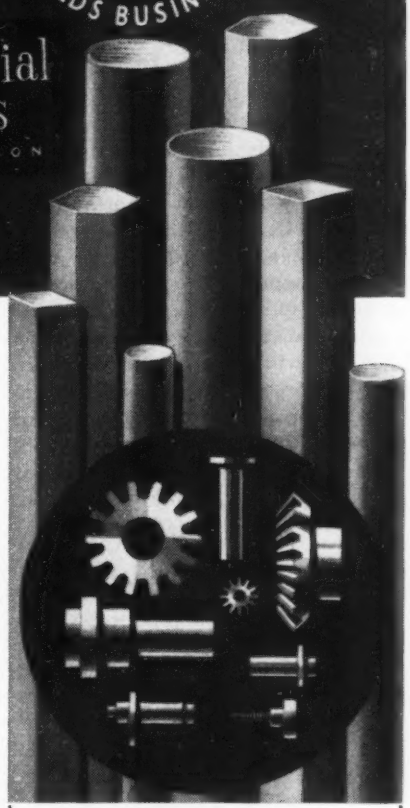
Multigraph
Commercial Controls CORPORATION
Remington Rand



...the original, free-machining, cold-finished open-hearth steel... for better quality precision parts at lower cost.

Look inside a business machine of any leading make, and most likely you'll be looking at a mass of precision parts accurately machined from J&L cold-finished *Jalcase* Steel. To the uninitiated, the "brains" of these modern marvels appear like an insolvable maze, but every tiny gear, lever and cam has a definite job to do—a definite function to perform for rigid accuracy.

There are some sound business reasons why so many of these working parts are made from J&L *Jalcase*—the *original*, free-cutting, open-hearth steel:

- **Jalcase is the leading free-cutting steel—and has been for more than 25 years.**
- **It machines smoothly and easily at high speeds.**
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- **It has high wear resistance.**
- **Ten grades plus a number of special treatments offer the Jalcase user a wide range of desirable properties.**

If you machine steel in the manufacture of your products—investigate *Jalcase!*

We have just published a new brochure on cold-finished *Jalcase*, and shall be glad to send a copy to anyone interested in machining rod and bar stock. The coupon at the right is for your convenience.

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West Coast Plant...

... to augment supply of electrolytic and hot-dip cold reduced tin plate

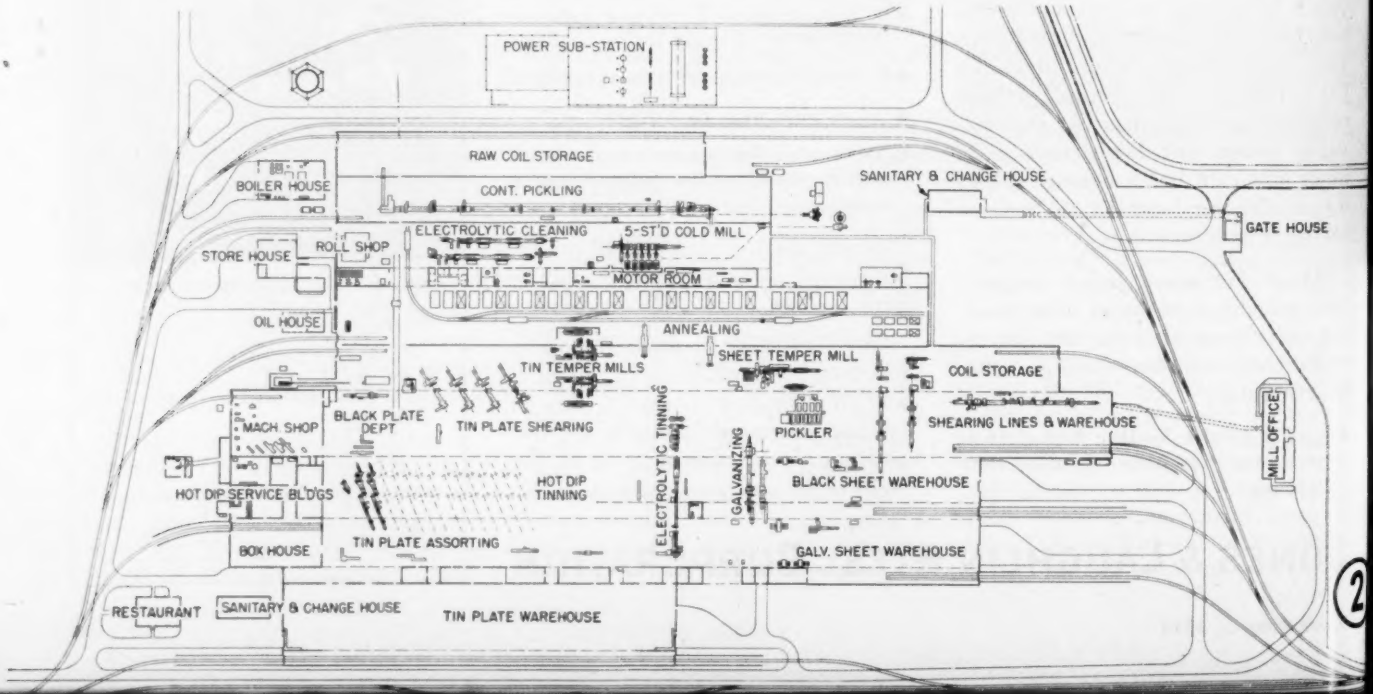
ADDITION of a new cold-reduction mill and finishing facilities for flat rolled steel products to its plant at Pittsburg, Calif., now enables Columbia Steel Co. to add cold-reduced tin plate and sheet steel to the broad list of products it manufactures to meet the diverse needs of the West. Output of regular products manufactured will be increased, since steel for cold reduction will be obtained in the form of hot-rolled coils from Geneva Steel Co. or other corporation subsidiaries. This will release steel produced in the open-hearth furnaces at the Pittsburg plant that was formerly processed into sheets and tin plate for increased production of regular products.

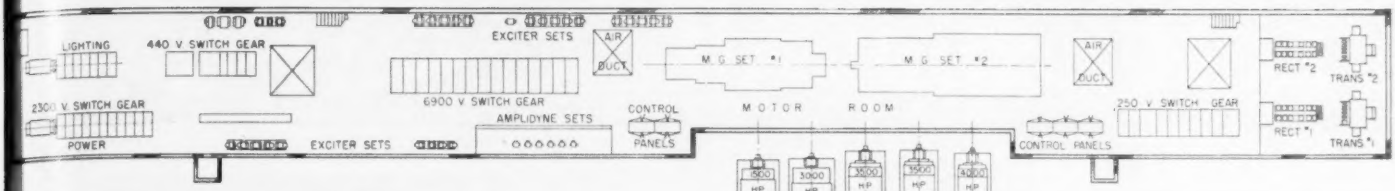
Items to be produced include: Merchant bar and bar shapes, reinforcing bar, electrolytic and hot-dip tin plate, cold-reduced sheets, galvanized flat sheets, galvanized culvert stock, galvanized roofing and siding sheets, bright wire, annealed wire, galvanized wire, spring wire, welding wire, barbed wire, bale ties, fish-trap netting, fence, nails, wire rope, strand, and steel castings.

Features of the tinning operations in the new plant include the use of automatic feeding and electrolytic pickling of sheets at the tin stacks to eliminate manual handling and

Fig. 1—Overall view of five-stand, tandem, four-high, cold reduction mill which rolls material at rate of 3900 feet per minute. Main motors driving this huge unit total 15,500 horsepower

Fig. 2—General plant layout





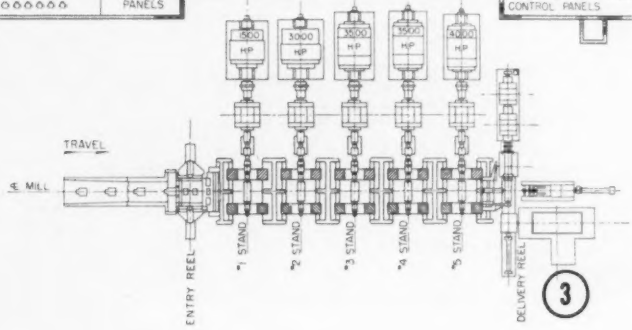


Fig. 3 — Plan of five stand reduction mill

white pickling; and assorting, counting, weighing, and packaging tin plate in a continuous line in tandem with the tin machine to avoid manual handling in inspection and tractor handling of the unpackaged finished product.

Forming only part of a long-range modernization and expansion program, the new production units added to the plant include: A five-stand, four-high cold-reduction mill; a continuous pickling unit; two electrolytic cleaning lines; six tin coil-annealing furnaces; four sheet coil-annealing furnaces; equipment for generating controlled atmosphere gas used in all annealing furnaces to prevent oxidation of steel during heat-treatment; two two-stand, tandem, four-high tin temper mills; three tin-plate shearing lines; one tin-plate side-trimming and recoil line; one single-stand, four-high sheet temper mill; a sheet shearing line for cold-reduced sheet steel; two auxiliary sheet-shearing lines; a sheet galvanizing line; fourteen hot-dip tinning units and auxiliaries; an electrolytic tinning line; and sixteen mechanical assorting, reckoning, and piling lines for tin plate.

Rolling Steel for Tin Plate — Hot-rolled steel coils received at the plant are accommodated in a large storage bay, from which material is drawn as required to meet rolling schedules. Hot-rolled steel coils intended for processing into tin plate are first run through the continuous pickling unit, where they are thoroughly cleaned. Steel is recoiled at the end of the pickling line, and taken to the cold-reduction mill, where it is rolled within a few thousandths of an inch of desired thickness and coiled as it leaves the mill. Oil that accumulates on the strip during rolling is removed in an electrolytic cleaning line. The material is uncoiled continuously at the entrance end of the cleaning line, and recoiled as it leaves the line.

Material to be processed into tin plate, after cleaning in the electrolytic line, is loaded in the tin coil annealing furnaces and, after annealing, is run through tin temper mills, where it is reduced to final desired thickness. After temper rolling, the flow of material is split, according to whether it is to be tinned electrolytically, or by the hot-dip process. If to be tinned electrolytically, it is passed through the tin plate side trimming and recoiling line, cleaned, electrolytically plated with tin, sheared into the ordered sizes, inspected and assorted as it comes off the line.

Hot-dip tin plate is produced by cutting cold-reduced, annealed and tempered steel into sheets of proper sizes in three continuous shear lines, followed by pickling, tinning, and in-

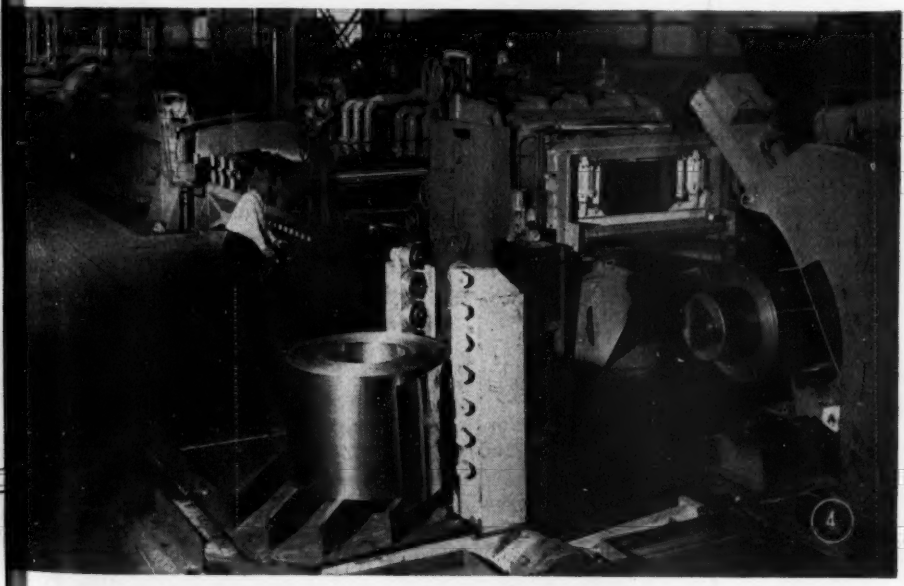
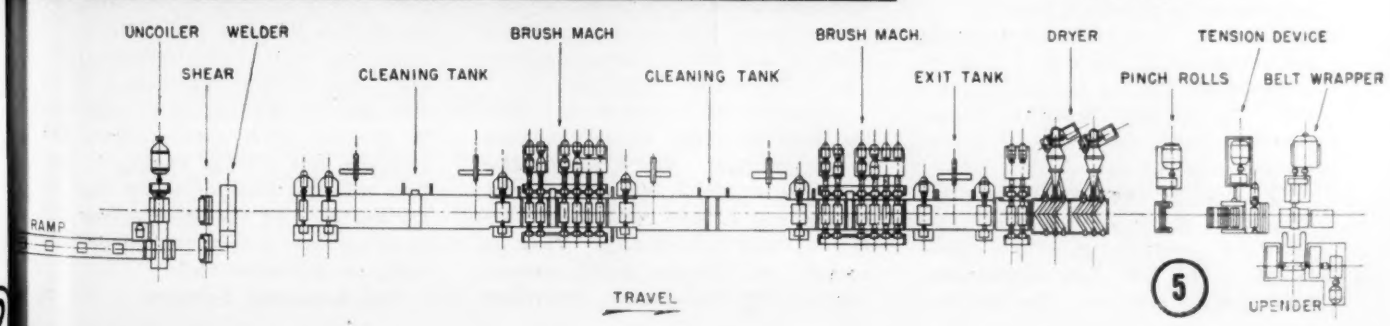
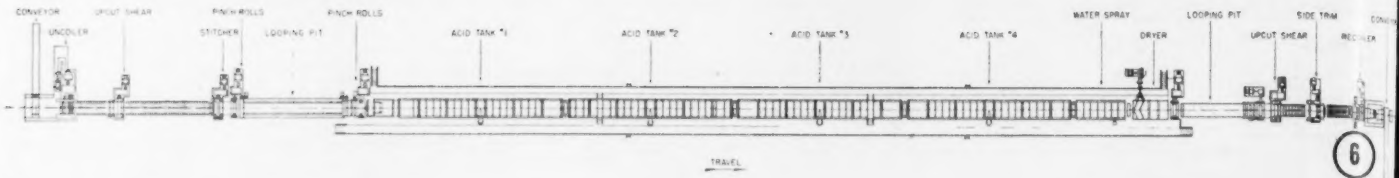


Fig. 4—Exit end of one of two continuous electrolytic cleaning lines which are part of the $25 million expansion and modernization program at Columbia Steel Co.

Fig. 5—Layout of electrolytic cleaning line





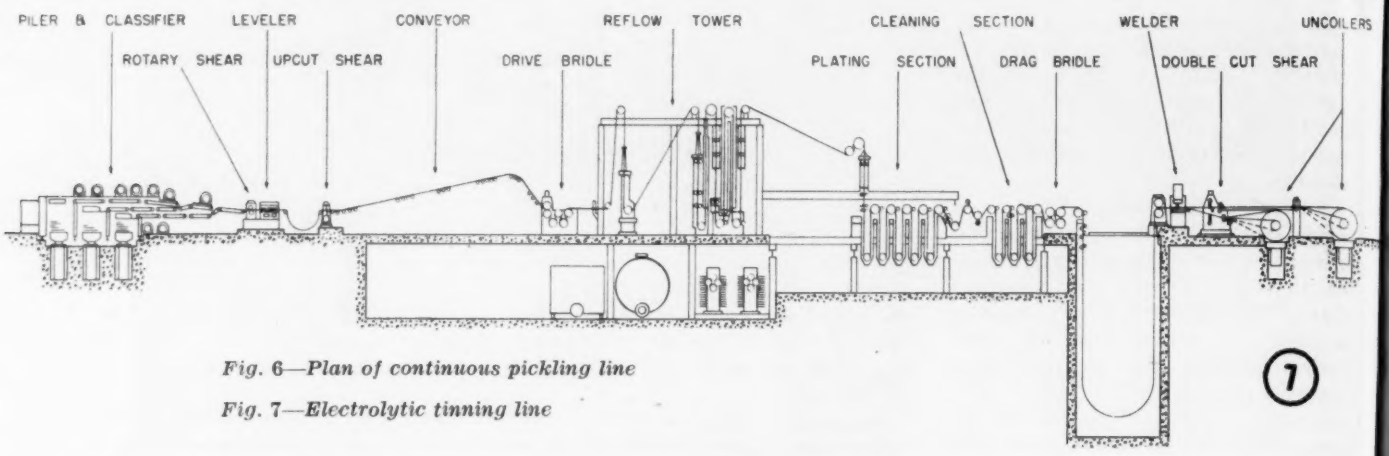


Fig. 6—Plan of continuous pickling line

Fig. 7—Electrolytic tinning line

spection and assorting of the material as it passes out of the tinning line.

In both types of tin plate production, finished plate is ready for packaging and stocking or shipment after assorting.

Continuous Pickling Unit — The continuous pickling unit can process mild steel coils of 30 inch inside diameter, 58 inch outside diameter, 54 inch maximum width, and thickness from 0.1875 to 0.060-inch. Coils fed into the continuous pickling unit first pass through a processing uncoiler, which has a maximum operating speed of 650 feet per minute. Leveling of the material is accomplished by a staggered series of 6-1/2 inch diameter rolls. "Coil breaks" are removed by 5 inch diameter processing rolls. Material is pulled through the machine by 8 inch diameter pulling rolls on the exit side.

An up-cut shear crops the ends of the coils. The trailing end of a coil passing through the line is joined to the leading end of its succeeding coil by a stitcher of the upstroke type, which is equipped with heavy pinch rolls of special metal composition and air-operated entry side guides. Stitcher is followed in the line by a looper-guide pit, in which the product can accumulate to provide a loop that allows the line to operate continuously while the end of the coil is momentarily halted for the stitching operation. The pit also serves the important function of aiding the guiding of the coil into the line.

The cleaning operation takes place in a series of five rubber-lined brick-sheathed tanks with rubber lined covers. The first four contain the acid pickling solution. The last is a combination hot and cold water rinse tank. Steam, water and air are supplied through jets, with acid supply being controlled automatically. Support and hold-down rolls control the passage of the steel through the successive tanks while immersed in the pickling solution.

Average speed of material through the pickling line is about 350 feet per minute.

Following the rinse station is a dryer that operates by blowing heated air on the metal surfaces. The air is heated by passing over steam coils.

To separate the successive lengths of material as the stitched portions emerge from the line, a cut-out shear of the upcut-type is used.

As material leaves the pickling line, it is oiled to protect it from rusting before rolling. It then passes through a side trimmer that continuously trims the sides to accurate width, after which it is recoiled.

Five-Stand Cold-Reduction Mill— The five-stand tandem four-high cold-reduction mill consists of five identical stands. Work rolls of each stand are 21 inches in diameter with a 56 inch face, equipped with four-row 13.506-inch inside diameter roller bearings. Back-up rolls for each stand are 53 inches in diameter, with 55 inch faces, and are equipped with pressure lubricated radial bearings and roller thrust bearings.

The main mill motors that drive the mill have the following horsepower ratings: No. 1 stand, 1500 horsepower; No. 2, 3000 horsepower; Nos. 3 and 4, 3500 horsepower; and No. 5, 4000 horsepower. They all operate on 600-volt direct current, supplied by two motor generators. The mill has a nominal maximum finishing speed of 3900 feet per minute. Capacity of the mill will be about 450 net tons per eight-hour turn.

Electrolytic Cleaning Line — The electrolytic cleaning line for tin plate coils was designed to handle steel in widths up to 38 inches. It was designed to operate at a maximum speed of 2000 feet per minute, when processing material from coils of the following dimensions: Outside diameter, 66 inches; width, 38 inches; and a maximum weight of product 0.030 inch thick and lighter in coils of 30,000 pounds. The line is a complete, integrated operating unit.

Successive coil lengths passing through the cleaning line are welded end-to-end to provide a continuous feed for the line. Two air-operated shears cut off coil crop ends prior to the welding operation at the entry end. A single air-operated shear at the exit end of the cleaning line cuts material to suitable coil length.

The cleaning tank is approximately 135 feet long. In series, the installation consists of a cleaning section, a scrubbing section, a second cleaning section, a second scrubbing section, and a final rinse section. Travel through the sections is controlled by six 30 inch diameter sink rolls, brush scrubbing and brush back-up rolls, and rubber rolls, distributed along the line in their proper locations. A 25 foot dryer table follows the cleaning line. It is equipped with two blowers, each of which has an air heater. As the steel leaves the cleaning line, it is wound again into coils, on a tension reel.

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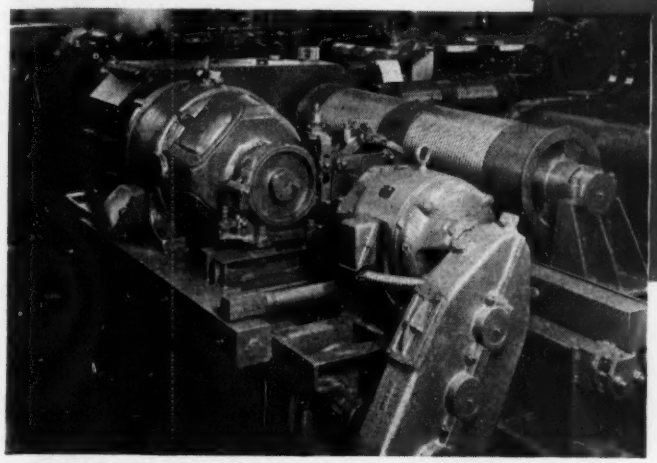
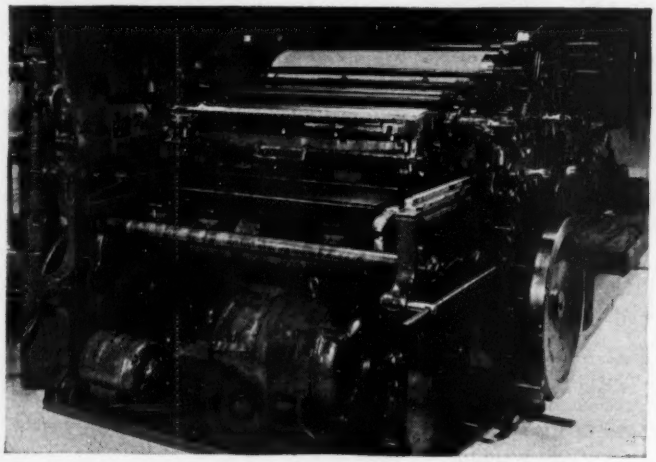
Century SLIP RING MOTORS

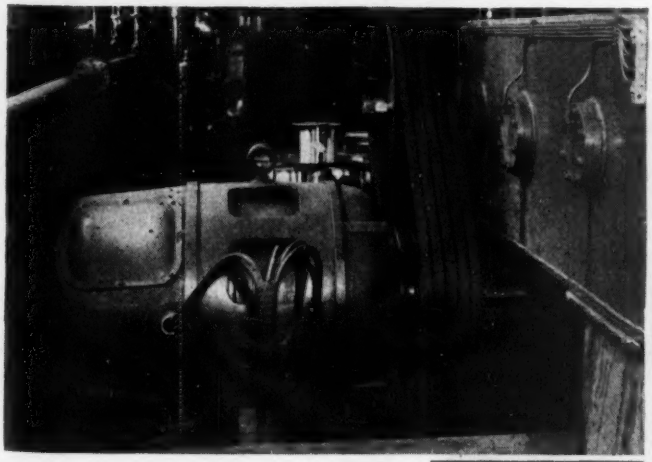
Supply High Torque AND Smooth Acceleration for Applications Requiring...



● 40 horsepower Century Slip Ring motor drives crane hoist and 5 horsepower Slip Ring motor drives crane travel.



● 10 horsepower Century Slip Ring motor supplies flexible power for a printing press.



● 75 horsepower Century Slip Ring motor driving wire plant machine.

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Typical applications for these motors are: cranes, hoists, bending rolls, printing presses, wire mills, bridges, mitergates, locks, dams, conveyors, elevators, reciprocating pumps, and other high impact and inertia loads.

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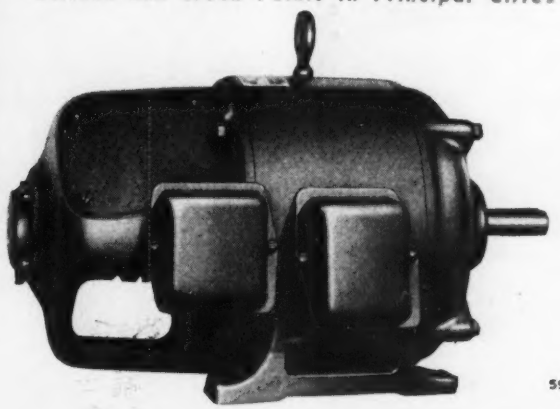

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have been provided ten rectangular, bell-type annealing furnaces for the heat-treatment of tin and sheet coils. Six furnaces are normally used for annealing tin coils. Thirty bases have been installed for the furnaces, each base accommodating eight stacks of 56 inch coils having a piling height of 150 inches. Furnaces were designed for carrying out annealing operations at metal temperatures up to 1350°F.

Stacks of coils are protected during the annealing operation by covers, and, to prevent oxidation of the steel surfaces during annealing, a separately prepared controlled atmosphere is maintained surrounding the steel during the operation. This atmosphere gas is supplied by three generators having individual capacities of 10,000 cubic feet per hour.

Tin Temper Mills — Annealed coils of cold-reduced steel for production of tin plate by the electrolytic method are first rolled in temper mills in which a slight reduction of the thickness is effected (with some consequent elongation), to produce a superior surface and impart desirable physical properties. This rolling is performed in either of two, two-stand tandem, four-high temper mills.

Each of the two-stand temper pass mills has two 18 inch diameter by 42 inch wide work rolls equipped with four-row, 8 inch inside diameter roller bearings; and two 49 inch diameter by 42 inch width back-up rolls equipped with 42 inch sleeve radial bearings and roller-thrust bearings.

The two, two-stand tandem four-high tin temper mills each have a maximum finishing speed of 3000 feet per minute, and are designed to handle 30,000-pound cold-reduced and annealed mild steel coils from 16 to 38 inches wide and from No. 16 to No. 38 gage in thickness. Coils are 20 inches in inside diameter and may have up to 60 inches outside diameter. The No. 1 and No. 2 stands of each mill are respectively driven by a 500 and an 800-horsepower motor, operating on 600-volt direct current.

Tin Plate Side Trimming and Recoiling Line — Coils of cold-reduced, annealed and tempered steel which are to be continuously plated with tin by the electrolytic process are first passed through a side trimming and recoil line to cut the product to exact width. This line has a capacity for handling the coils from the temper mills at a maximum speed of 1800 feet per minute.

Following the side trimmer is an air-operated shear which cuts off the crop ends of the coils. The shear is followed by a travelhead series seam-welder.

As the material emerges from the welding station, it is paid off into a loop by pinch rolls. Following the loop is a tension bridle. Leaving the tension bridle, the product is coiled on a tension reel that can wind tight coils weighing up to 30,000 pounds.

Electrolytic Tinning Unit — The continuous electrolytic tinning line is somewhat over 250 feet in length. At the entry end, two coil holders, various pinch rolls and guides, a double cut shear and a welder precede a 60 foot looping pit. This pit affords slack that permits the tinning line to operate continuously while the coil is momentarily stopped at the entry end to permit welding of successive lengths, and also provides a length of tension-free material that enables it to be fed accurately into the tinning line.

The uncoated product first passes in vertical loops through successive cleaning, rinsing and pickling solutions, through a brushing and rinsing machine where pickle salts and solution are removed, and thence into the first of the four electroplating tanks. As it emerges from the fourth plating tank, it is rinsed and passes to a vertical muffle furnace where it is heated until the tin coating flows. It is then quenched in water, after which it moves through a chemical treating unit and then through an emulsion oiling machine.

The tinned product next passes over a hump conveyor into a combined roller leveler and rotary flying shear which cuts it into ordered sizes. The sheared tin plate passes from the shear directly to the classifying conveyors, where it is sorted into three lots—off-gage plate, menders, and prime plate. The prime plate is counted into desired size bundles and is carried away from the tinning line classifier on a roller conveyor at right angles to the line. The prime bundles of plate are weighed on a scale on this conveyor and are then packaged for shipment. The tinning line can produce tin coated material from 0.007-inch thick to 0.0148-inch thick, between 16 and 42 inches wide and up to 42 inches long at speeds up to 600 feet per minute. Plate from the off-gage and mender pilers is transferred to a reclassification line, described in detail below, for further inspection and necessary extra treatment and/or special disposition.

Hot-Dip Tinning — Hot-dip tinning operations are carried out on individual sheets instead of on continuous lengths from coils as in the case of electrolytic tinning. Shearing of the cold-reduced, annealed and tempered coils into sheets is done on three similar tin plate shearing lines. Each of these complete lines incorporates all of the components necessary for coil handling, side trimming, shearing to length and piling.

The rotary flying shear of each line is suitable for cutting 22 to 38 gage material with a shearing range of 19 to 42 inches at speeds up to 1000 feet per minute. Three shear heads are required to cover the complete range.

Following the rotary shear in each

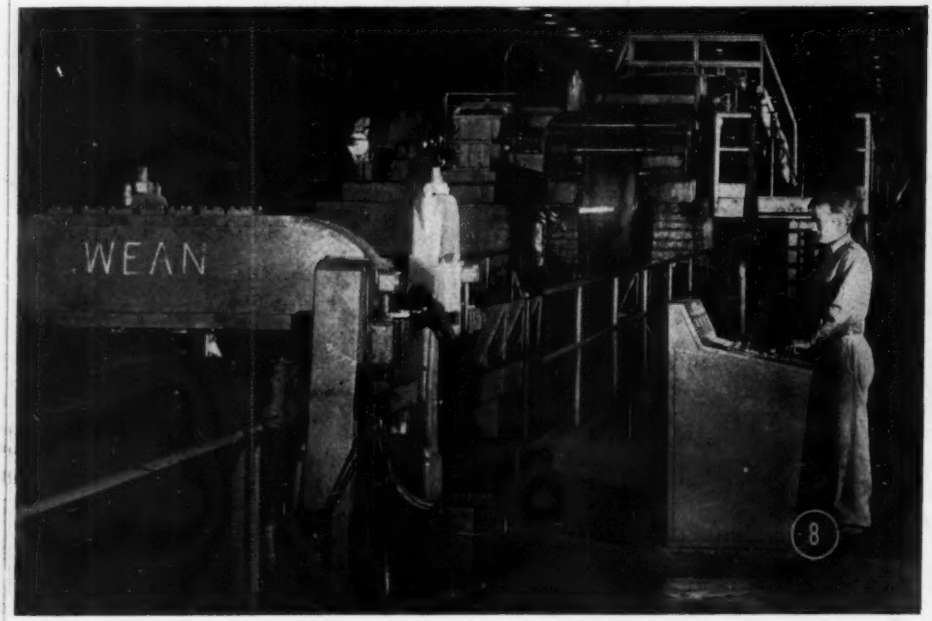


Fig. 8—Entry end of continuous pickling line showing sheet stitcher at extreme left

Fig. 9—Control station for one of the galvanizing lines showing molten zinc pot in left background. Sheets are fed and conducted through this bath by suitable mechanisms

line is a classifier, including belt conveyors and pilers, arranged to segregate material into prime and reject piles. Piles are formed on skids arranged for entry on one side and exit on the other side, actuated by an air-operated pusher. Each shear line is equipped with a flying micrometer and a photoelectric pinhole detector.

Hot-Dip Tinning Units and Auxiliaries — The new plant has a total of fourteen hot-dip tinning units complete with auxiliary equipment. These lines will process tin plate between 16 and 25 to 36 inches wide, 20 to 36 inches long, and between 26 and 38 gage in thickness. Maximum weight of pile that can be accommodated by the handling equipment at the entry end of the lines is 12,000 pounds. Prime coated plate is automatically reckoned and piled in specified quantities for packaging, warehousing, and shipping. Each of the fourteen 75 inch coating units consists of an entry conveyor, automatic feeding unit, electrolytic pickling unit, tin pot and setting, tinning feeder and tinning machine, catcher and conveyor, washer, and cleaner; followed in each case by a mechanical assorting, reckoning, and piling line.

Supplementing the fourteen coating units, the installation includes a 45 inch recleaning line consisting of a hydraulic hoist, a 1-5/8 inch diameter backed-up type roller leveler, a washer, a cleaner and a piler.

Automatic firing equipment for the fourteen tin pots is supplied with desired natural gas-air mixture by two industrial-type carburetors, each with a capacity of 120,000 cubic feet per hour of proportioned mixture. Air is supplied to the carburetors by turbo-compressors driven by 30-horsepower, 1800 fpm totally-enclosed, fan-cooled, explosion-proof, squirrel-cage motors. Two electrostatic precipitators remove dust from air being supplied to the carburetors

Each tin pot is heated by two immersion-type elements. In addition, a high-pressure inspirating-type gas burner is installed on the palm oil side of the pot for supplementary heating of the palm oil when required. The bath temperature is controlled in each pot by a single point indicating and recording controller. A similar temperature control system regulates palm oil temperature on each pot.

A soda ash mixing and distributing system delivers detergent solution to each of the washers as required. The system consists of a steel tank where the soda ash is dissolved in a measured amount of water, and necessary metering and distribution equipment to provide required flow into each tinning line washer. A washer waste-liquid system handles the overflow from the wet washers and comprises a system of open troughs, a neutralizing plant, separation tanks for separation of oil from neutralized solution, and necessary pumping equipment.

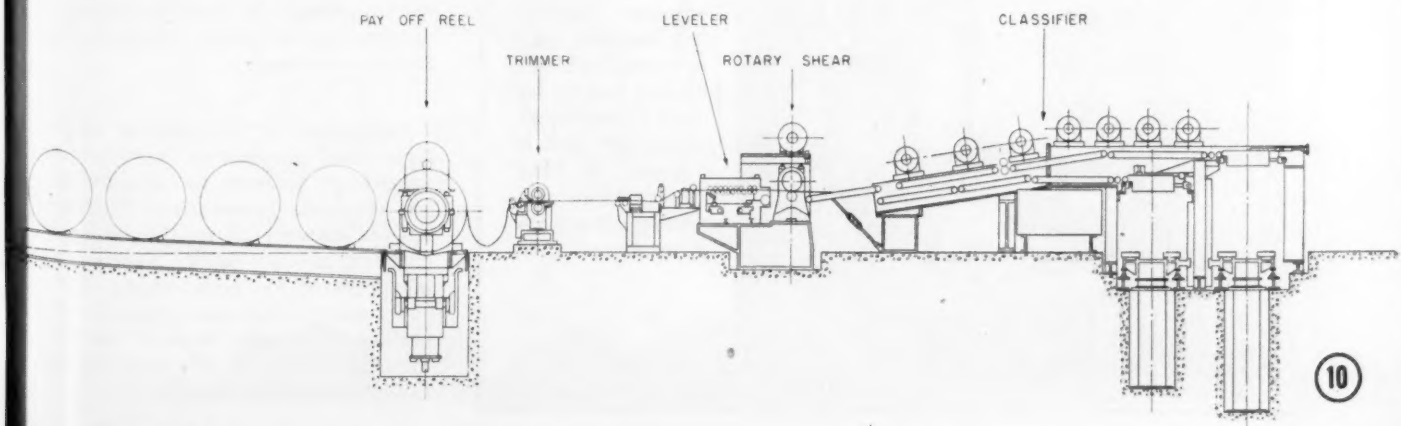
An acid mixing system automatically feeds dilute acid to each pickling unit.

The dilute acid is stored in two 100-gallon capacity rubber-lined tanks.

Rubber-lined piping connects the dilute acid mixing system and the feeding system to each of the electrolytic pickling units preceding each tin pot. The waste acid system consists of a common drain line from each pickling unit connected to an acid-resistant centrifugal pump.

Facilities for processing scruff to recover metallic tin include a fur-

Fig. 10—Continuous tin shearing line



nace and a scruff crusher. The crusher has 12 x 12 inch rolls, driven by V-belts powered by two 3 horsepower motors, and a vibrating screen driven by a 1 horsepower motor. Both motors are totally-enclosed, fan-cooled, squirrel-cage types. Combustion air for the gas fired scruff furnace is supplied by a blower. Firing is controlled by a combination air-gas, manually operated valve. The furnace stack is brick lined. A cast iron gas-fired pot and molds are provided for casting the recovered tin into anodes for the electrolytic tinning operation.

Mechanical Assorting, Reckoning and Piling Lines — Supplementing line classification performed on the fourteen hot dip tinning lines and on the electro-tinning line, two separate reclassification lines are installed for necessary reinspection of a portion of the product. Except for special feeding provisions on the separate lines, the fourteen mechanical assorting, reckoning, and piling assemblies in tandem with hot dip tinning equipment and the separate reclassification lines are similar.

All sixteen lines include an inspection device that is a 5-section, 7-spoke wheel with smooth surfaces that will not damage the surface of the tin plate. This wheel rotates in antifriction bearings with a through shaft directly connected to an hydraulic drive motor through a totally enclosed worm gear speed-reducing unit. The wheel has a speed of approximately 9 revolutions per minute. The fingers of the wheel come up between the rollers of an entry conveyor feeding either from the exit of the tinning line cleaners or from the vacuum cup feeders of the separate classification lines, to lift the plate, turn it over, and lower in onto the exit V-belt conveyor. A mender and a waste waste control are provided at this location so that a classifier, after inspecting both sides of a sheet, can divert it either to the mender or the waste waste pile, if necessary. If neither classification is made, the sheet automatically goes to the prime pile.

To effect diversion to the mender and waste waste pilers, each line is equipped with two solenoid-operated deflector gates.

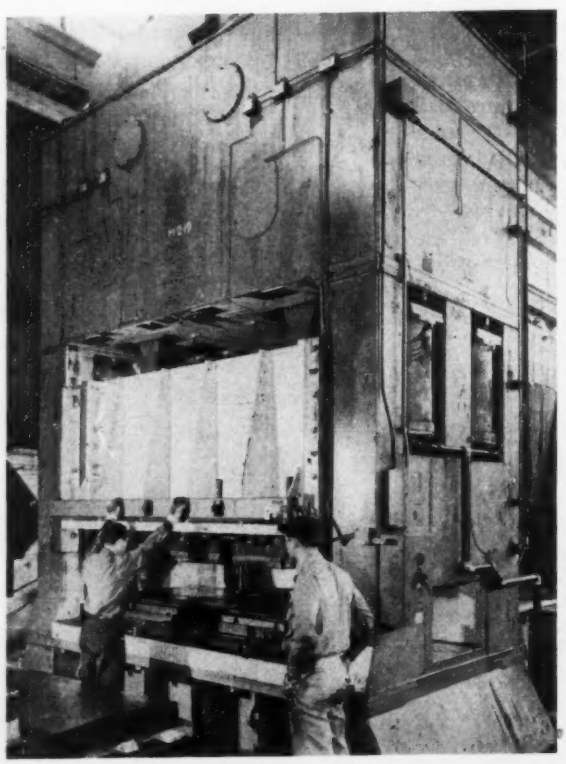
Classification into three groups—primes, menders, and wasters—requires three pilers for each of the sixteen lines, or a total of forty-eight in all. Each piler has side guides and an end stop to assist in maintaining a uniform, square pile. Prime piler hoists are electrically operated. All parts are above floor level. Provisions have been made to permit a new prime bundle to be started while a finished bundle is being removed from the piler. A counter tallies the prime sheets as they are piled and automatically resets to count successive bundles.

Conveyors are used to carry sheets forward in single file between individual units of the classifying lines. The first of these, a belt-driven roller conveyor provided in conjunction with the hot-dip tinning lines, is approximately 9 feet long and carries sheets, at right angles to the direction of tinning, from the cleaner exit into the inspection wheel. Inspection wheels of the separate reclassification lines ar fed by four strands of V-belt. The spokes of the inspection wheels come up between these strands to turn over the individual sheets for inspection of both sides.

The remaining three belt conveyors, operating with the piler, are 4 feet 10 inches, 5 feet 3-1/2 inches, and 5 feet 10-3/4 inches respectively, from the centerline of head shaft to the centerline of tail shaft. The first two employ two 10 inch wide endless flat belts set on 14 inch centers, the third employs two 7 inch wide endless flat belts set on 11 inch centers.

All conveyors are driven from a common drive located at the exit end of the first belt conveyor of each line. This drive consists of a totally enclosed gear-reduction unit with chain drive from the low-speed shaft to the driving pulley of the belt conveyor.

Approximately 35 feet of gravity roller conveyor are provided beyond each prime piler and feed directly to individual 8000 pound capacity scales. Roller conveyor run out is also provided beyond each scale to permit packaging of completed bundles before tractor pick-up. Mender and waste waste pilers are equipped with transfer cars, pneumatically-ejected buggies which move plate out at right angles to the line center line for tractor pick-up.



JACKET FORMER: This 500 ton press, designed to form outer jackets of electric water heaters, is one of 54 presses ranging from 50 to 750 tons installed in the new Milwaukee factory of Hotpoint Inc. A special two story bay had to be built to accommodate the high presses in the plant which recently began formal production

Develops Water-Cooled Open Hearth Door Frame

A new type open hearth door frame to provide durable service under difficult conditions was developed recently by Blaw-Knox Co., Blawnox, Pa. The new frame is of all-welded archless type with arch and jamb water cooling. It permits maximum opening both in width and height for furnace charging.

—o—

Publication of a chemical safety data sheet on calcium carbide was announced recently by Manufacturing Chemists Association, Washington, as number 23 in the series of chemical product safety manuals being prepared by them. Designed for supervisory staffs and management, manuals consisely present essential information for the safe handling and use of chemical products.

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National Metal Congress—*Concluded from Page 55*

L. Spanagel, engineering and industrial department, Rochester Gas & Electric Corp., Rochester, N. Y., treasurer; E. G. Mahin, head of metallurgy department, University of Notre Dame, South Bend, Ind.; C. M. Carmichael, vice president and director, Shawiningan Chemicals Ltd., Montreal, Canada; F. B. Foley, immediate past president, and two additional new members, Frederick J. Robbins, vice president and metallurgical engineer, Plomb Tool Co., and also president of Sierra Drawn Steel Corp., Los Angeles, and Harry P. Croft, director of technical control and research, midwestern district, Chase Brass & Copper Co., Cleveland.

In addition to awards already announced, (STEEL, Oct. 18, pp. 130 to 147), the Marion Howe medal was awarded to Joseph W. Spretnak, formerly on the research staff of Carnegie Institute of Technology and now at Ohio State University.

Non-Destructive Testing

TWELVE papers were presented at the 2-day, eighth annual meeting of the Society for Non-Destructive Testing, which assembled at the Benjamin Franklin Hotel, Oct. 27-28. Outstanding event during the organization's four technical sessions was the presentation of the 1948 Mehl lecture by Floyd A. Firestone, consulting physicist, now specializing in problems of sound, vibration, electronics and supersonics in Washington.

Dr. Firestone's lecture was on the supersonic reflectoscope, used for nondestructive testing and measuring by means of sound waves. Other subjects on the program included a description of experimental work employing radioisotopes cobalt and selenium, possible industrial applications of soft radiation, use of the mobile betatron at the U. S. Naval Ordnance Laboratory and high-speed cine radiography.

During the annual meeting, new national officers were named. These were: Dr. Dana W. Smith, research metallurgist, Permanente Metals Corp., Spokane, Wash., president; Dr. Leslie W. Ball, Naval Ordnance Laboratory, White Oak, Md., vice president; Herbert Mermagen, University of Rochester, Rochester, N. Y., treasurer. Both James H. Bly, Pratt & Whitney Aircraft, Division of United Aircraft Corp., East Hartford, Conn., and William E. Thomas, vice-president, Magnaflux Corp., Chicago, were installed as directors for 2 years.

AIME

SYMPOSIUM on rod and wire production practice was the highlight of the annual fall meeting of the Institute of Metals Division, American Institute of Mining and Metallurgical Engineers, holding its 3-day session, Oct. 25-27, at Hotel Adelphia. Both ferrous and nonferrous physical metallurgy subjects were presented on the program during the metal congress, although the Iron & Steel Division of the organization did not convene this fall.

In all, some 40 papers were given. These dealt with properties of metals and alloys, microscopy and grain growth, constitution and precipitation, plastic deformation, diffusion and surface phenomena, and transformation.

The symposium on rod and wire production practice consisted of eight papers covering various phases of steel wire production, corrosion and heat resisting alloy wire, nickel and copper alloys, aluminum, magnesium.

SPEED CUTTING: Faced with the problem of cutting a chrome nickel steel piston 3½ inches thick and a 5-inch cast iron cylinder, the service division of General Electric Co.'s plant in Fort Wayne, Ind., used the Oxyarc process developed by Arcos Corp., Philadelphia to complete the job in record time. This method of cutting metals combines a stream of oxygen and an electric arc. The finished cut is shown in inset

Welding Society

ACTIVITIES of the American Welding Society, meeting in the Bellevue-Stratford Hotel, Philadelphia, began Oct. 24 with the traditional president's reception.

During the remainder of the week, members of the organization attended 21 sessions in which 67 papers were presented covering every branch of the welding field. An innovation this year was the inclusion of an educational lecture series presented on three days early in the week by Dr. R. D. Stout of Lehigh University. "The Metallurgy of Arc Welds in Steels" was the subject.

Program got under way Monday morning with three simultaneous discussions involving ship design, railroads, storage tanks, pressure vessels and piping. Succeeding subjects during the week included brazing and metallizing, cutting, weldability, arcs and electrodes, resistance welding, inert-gas shielded arc welding, maintenance, automatic welding, hard surfacing and flame hardening. All of the meetings took place at the Bellevue-Stratford, except for Dr. Stout's educational lectures. These were given in Convention Hall.

New national officers of AWS are: G. N. Sieger, president and general manager, SMS Corp., Detroit, president, succeeding H. O. Hill, assistant chief engineer, Bethlehem Steel Co.; O. B. J. Fraser, assistant manager, Development and Research Division, International Nickel Co., New York, first vice president; H. W. Pierce, assistant to president, New York Shipbuilding Corp., Camden, N. J., second vice president; and R. S. Donald, sales engineer, Thomson Electric Welder Co., New York, treasurer.

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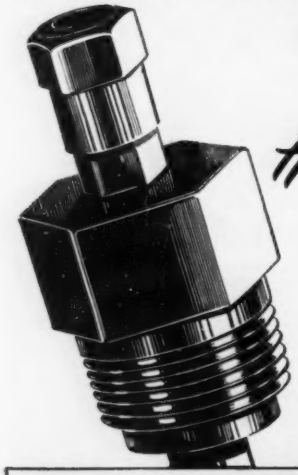

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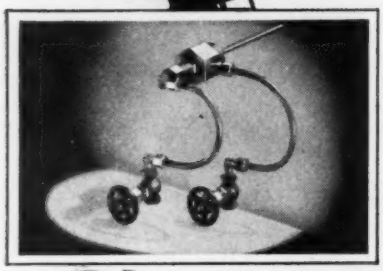

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ATTACH THIS COUPON TO YOUR LETTERHEAD AND MAIL

☐ RUSH 8-page bulletin giving specifications and engineering details.
☐ Glad to have your engineer determine our requirements.

NAME .....

TITLE .....

Control System

(*Continued from Page* 80)

manufacture the tool are secured. Whenever possible, these items are ordered so that they will be immediately available when the tool is in process in the tool room. Tool engineering usually procures such material directly and advises the purchasing department of the action.

Next, the number of hours required to make the tool is computed, and the checked and approved design is scheduled for production. The proposed delivery date, used as the scheduling reference, and the estimated manufacturing time are "fitted" on the loading chart to determine when the job must be started.

In scheduling the tool for manufacture, "Factory Order" requisitioning material and supplies is made as papers and information for the job are transferred to the tool room. At this stage of the procedure, the tool engineering department's file is corrected by replacing the tool production order, with the tool design control sheet the latter form being placed in a "Tool Manufacturing Scheduled" drawer and the TPO accompanying the job out into the shop.

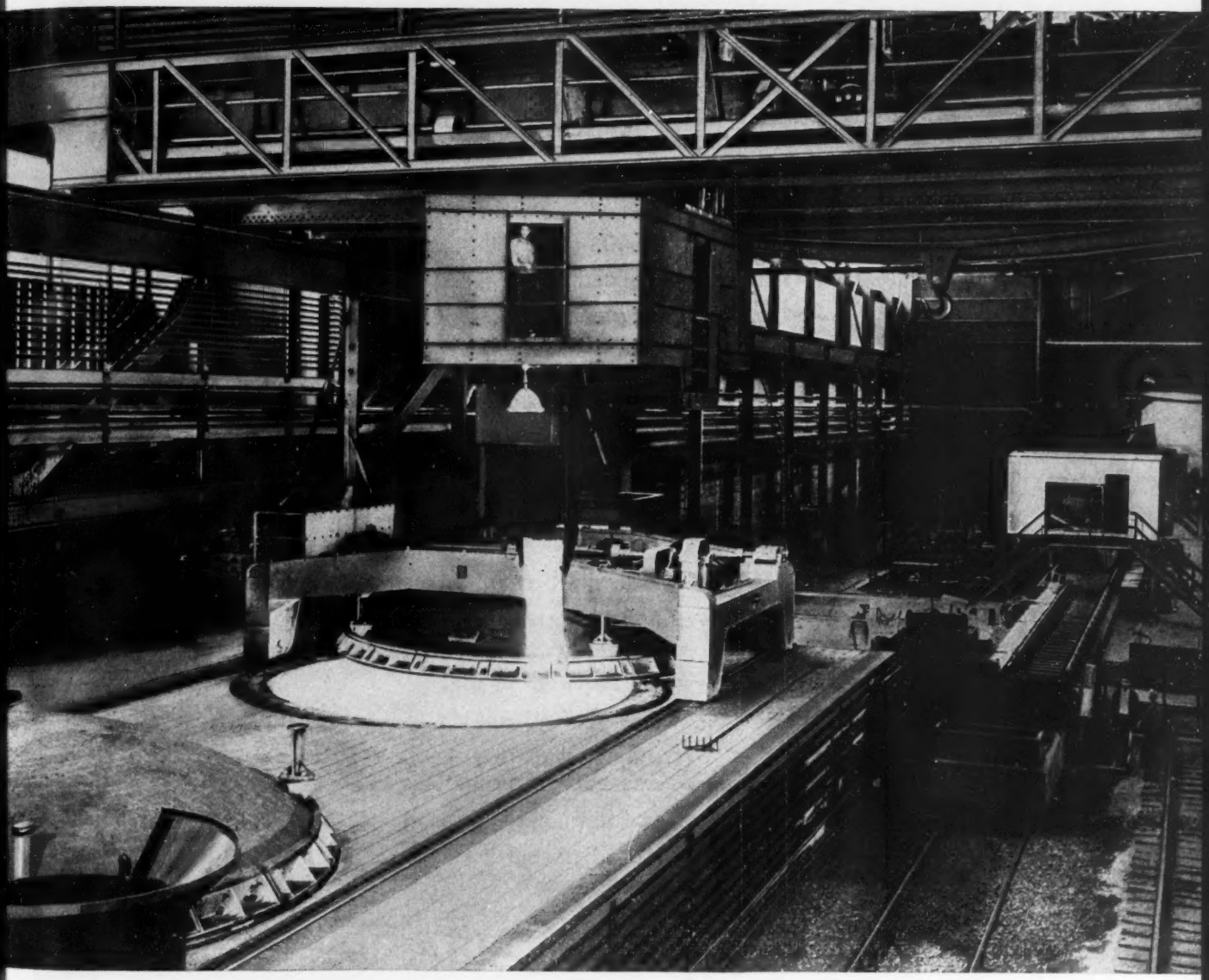
Revisions Made Periodically — Weekly "Tool Production Control" reports listing jobs completed and those still in process are submitted by the tool room to the tool engineering department, which uses this data to clear and revise its file. When a job is finished, for example, the TPO for that particular tool is returned along with the report to the department. The corresponding tool design control sheet is removed from the file and the TDC and TPO forms are placed in a completed job file. For work in process in the tool room, the design control sheet is transferred from the "Tool Manufacturing Scheduled" drawer to one labeled "Tool Manufacturing Process."

On new developments or projects involving five or more tools, a special "Tool Design Control" (Fig. 2b) form is used. This itemized listing includes brief descriptive data, such as tool name and number, and also gives the design and manufacturing starting and finishing dates. After the final tool list is approved in conference with the process engineering department of the particular plant involved, each tool is then processed in the usual way by making up the TPC and TPO forms previously mentioned.

Before production orders are returned by the tool room to the tool engineering department, they are

BUILT BY MORGAN Engineering

MORGAN 7½-TON, 81′3″ SPAN SOAKING PIT CRANE



Illustrated is a Morgan 7½-Ton, 6-Motor, 81′3″ Span, Stiff Leg Type Soaking Pit Crane. It serves a Morgan 36″ Two-High Blooming Mill which was furnished complete with auxiliary equipment. It is equipped with fabricated welded trolley and bridge trucks. Morgan Pit Cranes are provided with spur or worm gear operated trolleys and sleeve or anti-friction bearings as required.

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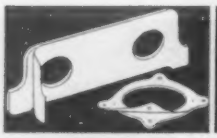
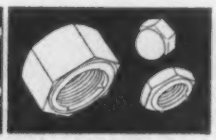


SHIMS

SHIM STOCK

STAMPINGS



AN-COR-LOX NUTS

routed with drawings and completed tools to the tool inspection department. In this way, tool inspection also can work to the delivery date specified and be guided in its work by other information contained on the production order. When the finished job passes final inspection and merits approval for quality, the tool is shipped to the plant for which it was manufactured and the TPO is returned to tool engineering for file-clearing.

Tool inspection's prime responsibilities consist of determining that certain basic conditions are satisfied —that the tool has been made to specifications enumerated on the drawing, that it is completely suitable for the part and processing operation intended, that the tool will fit the part and the machine, in addition to accomplishing its function within the limits of the product drawing.

Still another important duty of tool inspection is to notify process engineering and the tool crib (or the particular department to which the tool is to be sent) of the date when delivery of the tool will be made. To accomplish this, a triplicate bill of lading is included with the tool shipment. Copies of this bill of lading are sent to process engineering, the tool crib, or the department of the particular plant affected. Process engineering is advised of a new tool shipment by a "New Tool Notification" form which is issued by tool inspection at the same time the bill of lading is made.

Status Always Known—By means of the tool control system and routine outlined, the tool engineering department can report accurately, quickly and easily on the exact status of any tool order in the department at any time. The file is so arranged that either the tool design control or the tool production order, or both, are in the file at all times, making possible a quick reference check whenever desired. Record corrections are made daily, enabling the file to be continually maintained in up-to-date order.

For the convenience and information of manufacturing, process engineering, product engineering, production control, standards or other interested departments, tool engineering prepares a weekly "progress report" (Fig. 1), compiled from the filed data. Listing the jobs in process through the department or in the tool room and detailing such additional information as may be of value to the recipients, this report provides a recapitualtion of three important operational facts: (A) Design Loading—number of jobs completed for

the week and backlog remaining for each plant; (B) Manufacturing Loading — number of jobs finished and backlog for each plant; (C) Backlog Summary—loading in hours of Design and Manufacturing.

With this report, the company can determine quickly when extra measures must be taken to handle increased requirements in tool design, manufacturing and inspection. Used in combination with the other principal forms, this report presents a complete picture and progress appraisal of all departmental work. Accurate control—positive in results yet flexible in operation—of any phase of toolmaking is readily achieved with this system.

Carbide Welding Rods Developed for Hardfacing

Two tungsten carbide welding rods, cataloged as Tube Tungsite and Tungrod, are being manufactured by American Manganese Steel Division of American Brake Shoe Co., New York, for reclamation and hardfacing applications. The first named consists of tungsten carbide particles of various screen sizes encased in a steel tube which, when applied as a welding rod, melts forming a molten matrix. Since the particles have an extremely high melting point, they do not melt but instead remain in suspension.

As from 50 to 60 per cent of the deposit is tungsten carbide particles, rapid solidification is said to occur, evenly distributing the particles in the weld deposit. Offered in two types, bare for oxyacetylene application and bare for electric application, Tube Tungsite electrode is intended for hardfacing rotary drill bits, power shovel teeth, scraper blades and similar items.

Tungrod differs from Tube Tungsite in that its particles are from 40 screening down while that latter's particles range from 5 to 40 screen size. It is applied in two types, bare for oxyacetylene application and coated for electric applications. According to the company, this rod may be applied more thinly and smoothly to thinner base metals by the oxyacetylene process.

Correction

In the article entitled "Stainless Steels—Their Characteristics" which was presented in last week's issue, page 71, the caption for Fig. 2 should have read, "Iron-chromium-nickel diagram. Isothermal section at 1200° F."

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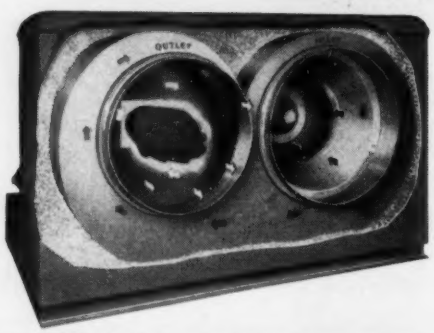
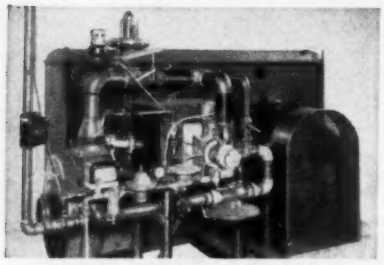
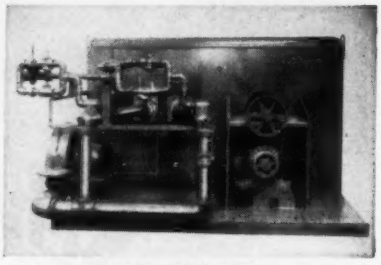
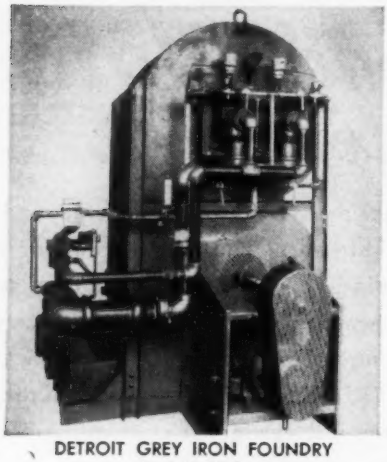




WESTINGHOUSE ELECTRIC MFG. CO.
Burns Gas and Oil



FORD MOTOR CO.
Burns Two Types of Gas



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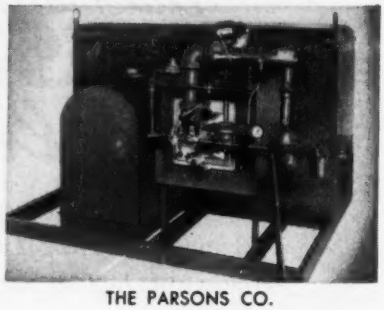

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"H" Band

(*Continued from Page* 81)

Recently, a great deal of attention is being given to the internal stresses which are set up by the heat treating practice. These may increase or decrease the useful strength of a steel part, depending upon whether the surface stresses are in compression or tension. The stresses which are set up, however, depend upon the response of the steel to the quenching operation, or in other words, the hardenability of the steel.

Control of Hardenability — Desirability of keeping hardenability within a narrow range has long been recognized. For some years before the war, numerous efforts were made to control hardenability by narrowing the permissible range for each of the elements present in steel. The present AISI-SAE specifications for some common alloy steels require the following close ranges of chemical composition, based on individual bar checks:

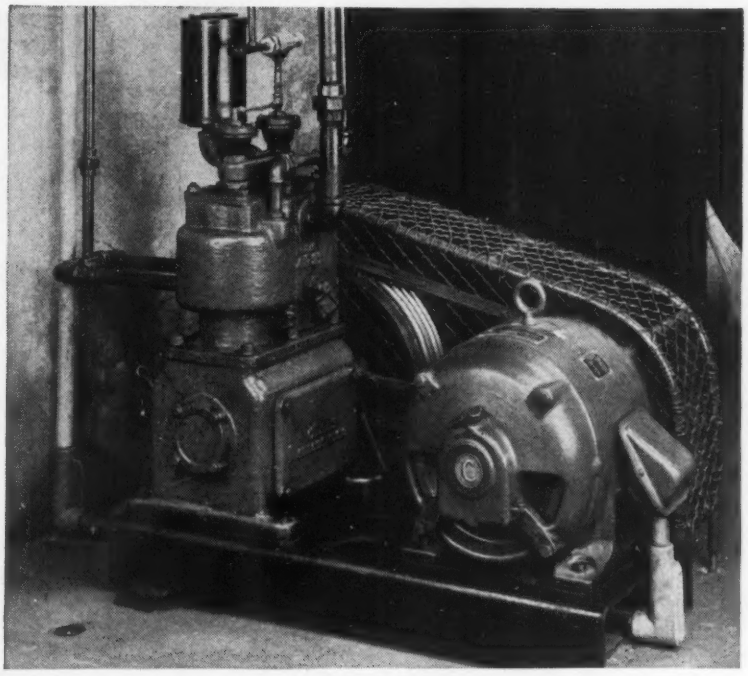
Carbon	9 points
Manganese	31 points
Nickel	36 points
Chromium	26 points
Molybdenum	14 points

As a result, the steelmakers had difficulty in producing all heats of steel within the narrow limits for the composition of all elements.

It was frequently necessary to request permission to ship steel which was out of specification so far as the per cent of a single element was concerned. At the same time, the users occasionally found that a heat of steel which had all of the elements on the low side, but still within the legal specification limits, might lack sufficient hardenability. Likewise, a heat of steel having all hardening elements on the high side, but still within the specification, would increase the hazard of cracking or distortion.

Hardenability Specifications—With these points in mind, the AISI and SAE jointly agreed upon an optional method of ordering steel in accordance with hardenability specifications, which would eliminate about 3 or 4 per cent of the heats, which were the lowest in hardenability, and a similar per cent of the ones which were the highest in hardenability. It was felt that from the user's standpoint, it was a closer control of hardenability which was desired rather than a closer control of chemical analysis of individual elements. On this basis it was agreed that the mills should be allowed a slightly wider range of analysis for individual elements, providing the closer range of hardenability was produced.

Curtis Timken Bearing Air Compressor. Sizes from ¼ to 50 H. P., inclusive.



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- Timken Roller Bearings
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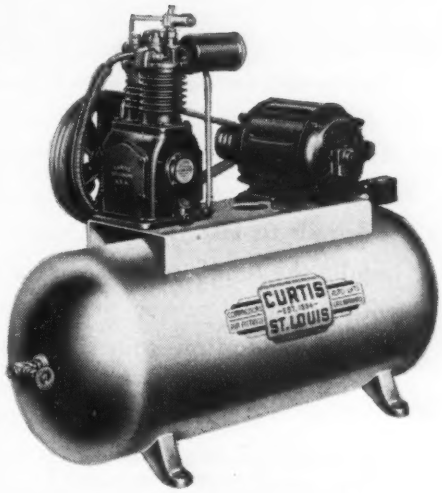

Curtis Timken Bearing Air Compressor with tank. Sizes from ¼ to 10 H.P., inclusive.

Write today for full information on Curtis Air Compressors, Air Hoists and Air Cylinders—or mail the coupon below.

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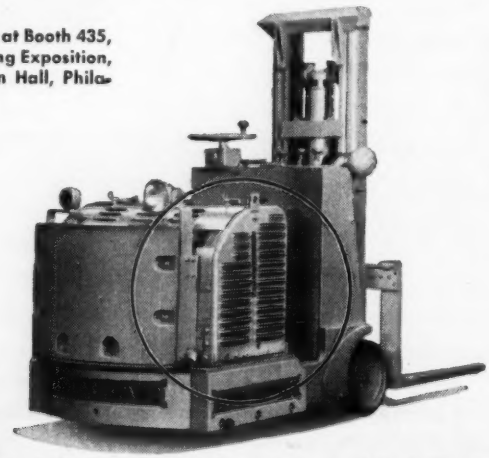
Visit the Ready-Power Display at Booth 435, 3rd National Materials Handling Exposition, January 10 to 14, Convention Hall, Philadelphia, Pa.



Ready-Power-Equipped Lewis-Shepard Fork Truck

THE READY-POWER CO.

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Actually, to produce a closer control of hardenability, it is necessary to maintain a closer control of the total chemical analysis, although a slightly wider range is permitted to facilitate the proper balancing of the composition.

As a result, a new series of specifications was set up which were similar to the previous SAE-AISI specifications except that a published hardenability band was published for each steel and a slightly wider range of analysis for individual elements permitted. At first these were published for trial only. Since then, these specifications with certain modifications and improvements have been accepted as standard.

The fact that the new "H" specifications allow a little wider range of analysis so far as individual elements are concerned, has led to a misconception on the part of some users that these steels are not as closely controlled with regard to hardenability as the steels which are purchased under chemical analysis specifications. This, however, is not the case, for while the H steel specifications do permit a wider range of analysis for individual elements, the summation of all the hardening elements in the steel must be more closely controlled in order to produce a hardenability that is within the "H" band.

Tapping Machine Suitable For Moderate Volume Jobs

Introduction of a special machine tool for tapping holes in automatic transmission cases has been made by Cross Co., Detroit. The tool, which is especially useful where only moderate production is required, taps 60 holes per unit at the rate of 65 pieces an hour.

Its work cycle is automatic and pushbutton controlled. When the button is pressed, 25 holes are tapped at station one. An automatic shuttle then carries the part to station two where 35 more holes are tapped, after which the part is returned for unloading.

—o—

Feature of a new heavy-duty intensive mixer introduced by Northmaster mixer department, Struthers Wells Corp., Titusville, Pa., is its large discharge opening which appreciably reduces loading and unloading time. The mixer, which is equipped with a rigid-construction, one-piece mixing chamber, is particularly adaptable for the rapid processing of rubber, plastics and linoleum asphalt composition.

Rubber Tired Truck Crane Picks Up 45 Tons

Weighing 65 tons and riding on twelve 13:00 x 24 eighteen ply excavator tires, the new two-engined motor truck crane, said to be the world's largest by its manufacturer, Thew Shovel Co., Lorain, O., has a lifting capacity of 45 tons at a 12 foot radius, using outriggers. The first such unit built is to see service in the Aliquippa Works of Jones & Laughlin Steel Corp.

Dimensions of the giant moto-crane are: Length, with boom in travel position over front of carrier, 66 feet, 5 inches; width, 11 feet 7¾-inches; height, with gantry erected, 19 feet 5 inches; height with gantry lowered, 14 feet. The unit's carrier has a weld-fabricated frame with multiple straight beam construction for side members which are solid steel 18 inches deep and over 2 inches thick. Outriggers are of the telescopic type, one amidships and one across the end of the carrier frame.

Power for the MC-820 unit is furnished by two Waukesha diesel engines, one for carrier propulsion and one for turntable operation. The Fuller transmission, mounted behind the engine, has five forward speeds and one reverse. Rear axles are of the double reduction, gear driven type. Steering of the independently mounted front dual wheels is air assisted steering mechanism.

A-MP's Tools, Wiring To Be Shown in Trailer

Design engineers and production men throughout the country will be able to see and operate the solderless wiring equipment, pneumatic presses and hand tools, electric and foot presses and precision hand tools made by Aircraft-Marine Products Inc., Harrisburg, Pa., in a completely equipped trailer now starting on a nation-wide tour.

The "Mobile-Wiring Clinic" will visit all major industrial areas and on request will be taken directly to plants for private demonstrations.

—o—

National Bureau of Standards and American Petroleum Institute have prepared a total of 144 compounds now available as NBS standard samples of hydrocarbons for calibrating analytical instruments and apparatus in the research, development and analytical laboratories of the petroleum, rubber, chemical and allied industries. Complete list of the samples and instructions for ordering are available from the bureau, Washington.

Developed by Holcroft in 1935 for

MORE ACCURATE, LOWER-COST CASE HARDENING

HOLCROFT engineers established the basic principle on which *all* modern gas carburizing furnaces operate—namely, that in order to control the process, a non-decarburizing gas must be used to dilute the hydrocarbon gases which supply the carbon for carburizing. In order to *apply* this principle, Holcroft & Company in 1935 designed and built a generator to produce such a diluting gas.

This patented development—resulting from original Holcroft research—brought all the advantages of today's gas carburizing process. These include (1) accurate control of case depth and carbon content; (2) exceptionally clean, soot-free work; (3) a notable increase in furnace alloy and tray life; and (4) greater output with much less labor. Because of these advantages, gas carburizing is rapidly replacing pack carburizing throughout industry.

Further details on the process are given in the Holcroft Gas Carburizing bulletin, available on request.

The Holcroft engineering leadership which developed gas carburizing is available to serve YOU in production heat treat work of every kind. And remember—Holcroft offers you COMPLETE METALLURGICAL AND ENGINEERING SERVICE, from designing the furnace to your individual needs through the trial run in your plant. We invite your inquiries.

SINCE 1916 **Holcroft AND COMPANY**

BUILT BY HOLCROFT & COMPANY DETROIT-MICH

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

6545 EPWORTH BLVD. DETROIT 10, MICHIGAN

CHICAGO 3
C. H. MARTIN, A. A. ENGELHARDT
1017 PEOPLES GAS BLDG.

CANADA
WALKER METAL PRODUCTS, LTD.
WALKERVILLE, ONTARIO

HOUSTON 1
R. E. McARDLE
5724 NAVIGATION BLVD.

THE Alliance GIANT

OVER 2,250 HORSEPOWER LIFT PER SECOND

Here's the giant of them all—the largest crane in the world! Designed and built by Alliance, this huge crane spans the Navy's mole at Hunter's Point, California, and is so big and powerful that it can easily lift a 500-ton battleship gun turret.

This is just one of the thousands of cranes developed by Alliance, for The Alliance Machine Co. builds all types—all sizes—to move heavy loads safely, quickly, and easily. For economical, *extra* lifting power in your plant, always depend on Alliance.

THE ALLIANCE MACHINE COMPANY

MAIN OFFICE
ALLIANCE, OHIO

PITTSBURGH OFFICE
1622 OLIVER BUILDING, PITTSBURGH, PA.

Built BY THE WORLD'S NUMBER ONE DESIGNER AND MANUFACTURER *of Cranes*

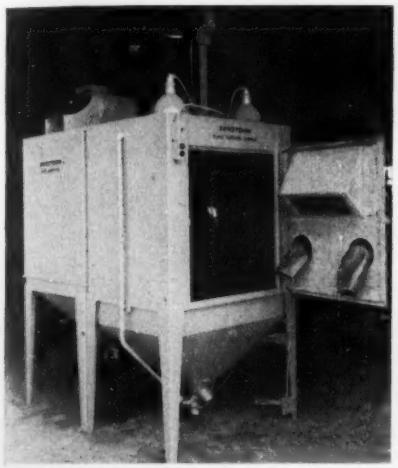
LADLE CRANES
GANTRY CRANES
STRIPPING CRANES
SOAKING PIT CRANES
FORGING MANIPULATORS
OPEN HEARTH CHARGING MACHINES · SLAB AND BILLET CHARGING MACHINES
SPECIAL MILL MACHINERY
STRUCTURAL FABRICATION

This rugged crane is so large that it has its own electric sub-station, aerial beacons to warn aircraft away, and a short-wave radio for communication between the operating crews.

New Products and Equipment

Sand Blast Cleaner

Virtually all types of metal cleaning on parts capable of being inserted into the various sized cabinets is possible with the sand blast cleaning machines developed by Sanstorm Blast Cleaning Co., Fresno, Calif., and distributed by Kelco Sales & Engineering Co., 11150 Hawthorne Ave., Inglewood, Calif. Units are



operated by a foot control valve pedal, thus leaving operator's hands free for insertion into arm protectors leading inside the illuminated cabinet for control of blasting nozzle movements and the work.

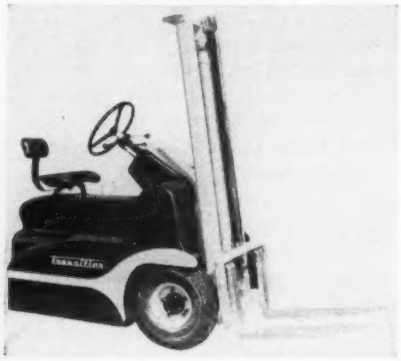
Blasting operation involves a suction feed system whereby the abrasive is drawn into the control mixer and is carried through the abrasive hose for discharge out the nozzle. Any abrasive such as sand, steel grit, shot, ground walnut shells or apricot pits that will slide freely on a 45-degree angle and will not pack can be effectively used. Machine construction is of steel plate, bolted and welded.

Check No. 1 on Reply Card for more Details

Light Weight Lift Truck

Transitier Truck Co., 2477 Northwest 23rd Ave., Portland 10, Ore., is offering a gasoline powered fork lift truck of 1000 and 2000 pound lift capacity which makes possible high speed loading and unloading of trucks and railroad cars. Full pneumatic tires allow fast travel on bumpy and uneven road or platform surfaces.

Truck has an all-welded one-piece body frame construction of heavy gage steel stampings, a 4-cylinder water-cooler Cobra engine of 26 horsepower, a 61-inch turning radius and hydraulically operated lift and tilt of load carrying mast. Its Hydroflex clutch is located behind and above the engine for accessibility. Total weight of the 1-ton capacity



model is about 3000 pounds. Both models are available in 5, 7 and 9-foot lift heights.

Check No. 2 on Reply Card for more Details

Shaper-Planer

Rockford Machine Tool Co., Rockford, Ill., is manufacturing the Hy-Draulic shaper-planer which combines the speed of a shaper with the accuracy and convience of a planer. It uses hydraulic pressure for the feeds as well as the table drive. Bed, columns and rail are of heavy cross-section for absolute rigidity under all work conditions. Machine has dual controls for rail head and table and can be supplied with two tool heads with automatic tool lifters for the cross rail and two side heads with automatic tool lifters.

The double housing shaper-planer is built in three sizes: 24 x 24 inches; 30 x 30 inches; and 36 x 36 inches. Stroke length sizes of 6, 8, 10 and 12 feet are built in each size. Open side shaper-planers are built in sizes: 24 x 24 inches; 24 x 36 inches; 32 x 24 inches; and 32 x 36 inches. Five stroke length sizes ranging from 42 to 144 inches are built into each

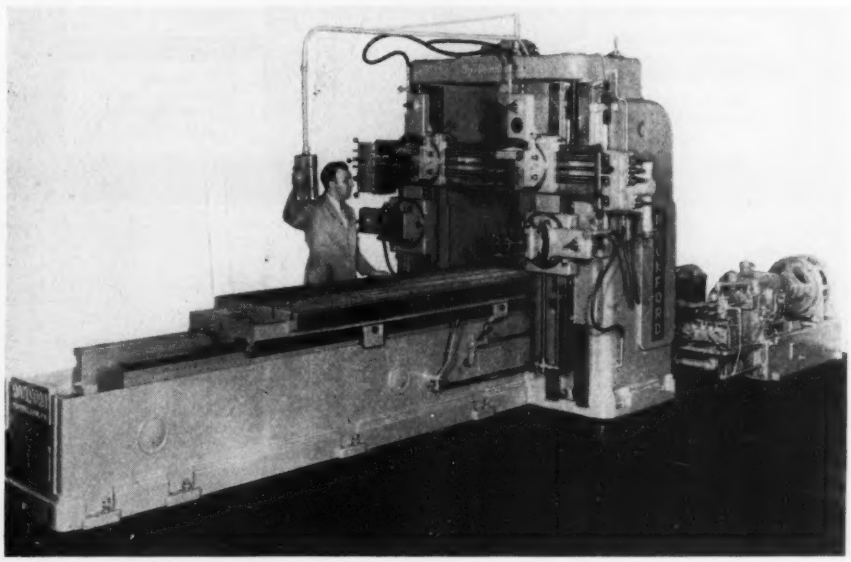
Check No. 3 on Reply Card for more Details

Gearmotors

The "pancake" type axial air gap motor, made by Fairbanks, Morse & Co., 600 South Michigan Ave., Chicago 5, Ill., is being offered as a motor reducer. They are available in ratings from ¾ to 10 horsepower

and are symmetrical in design with no separate right or left hand assemblies. The motor may also be removed from the gear housing and run separately.

Two ratios of single helical gears with hardened and accurately shaved teeth arranged in simple gear trains are employed. Motor and gear shafts are parallel, with the centerline of



for better finishes use

CLEAN DRY AIR

- cuts rejects and refinishing
- stops customer complaints

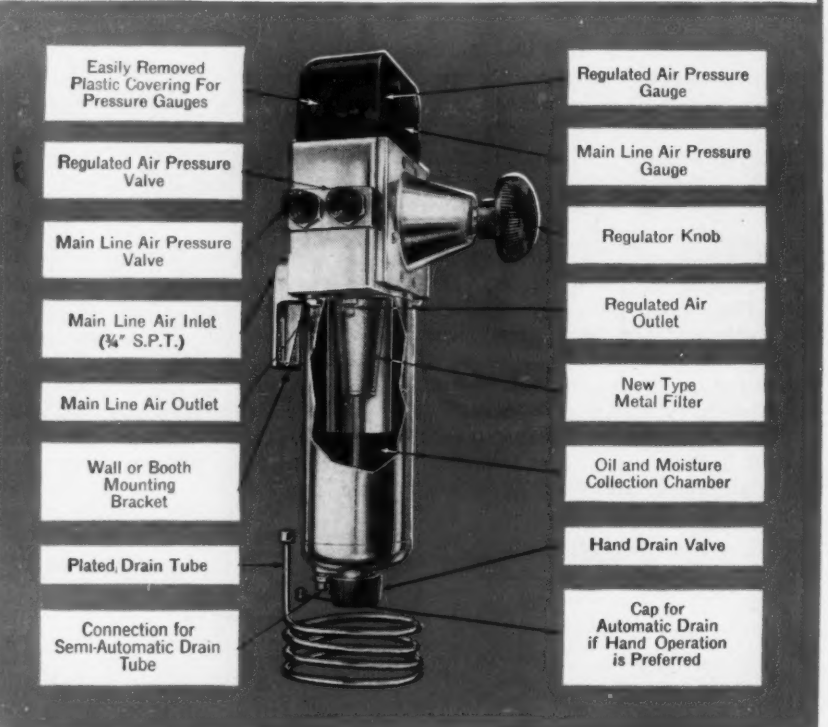
Binks oil and water extractors

Perfect finishing demands clean, dry air at the right pressure. Foreign substances such as oil, water, dust, rust and other impurities must be removed or serious trouble results.

Binks Model E-75 oil and water extractor meets the requirements of modern finishing. It delivers 75 cubic feet of perfectly clean, dry air per minute . . . enough to operate several production spray guns at full capacity.

There are no filter packs to buy or renew, no time lost obtaining or replacing them. The special metal filter (heart of the unit) is easily cleaned, lasts indefinitely. There are no moving parts. The E-75 drains itself when the air supply shuts down. A manual drain is also provided.

There is a Binks oil and water extractor for every size operation. See Binks catalog for full information.


Easily Removed Plastic Covering For Pressure Gauges
Regulated Air Pressure Valve
Main Line Air Pressure Valve
Main Line Air Inlet (¾" S.P.T.)
Main Line Air Outlet
Wall or Booth Mounting Bracket
Plated Drain Tube
Connection for Semi-Automatic Drain Tube
Regulated Air Pressure Gauge
Main Line Air Pressure Gauge
Regulator Knob
Regulated Air Outlet
New Type Metal Filter
Oil and Moisture Collection Chamber
Hand Drain Valve
Cap for Automatic Drain if Hand Operation is Preferred

"Binks welcomes every opportunity for service in the solution of your finishing problems."

J. J. Roche
President

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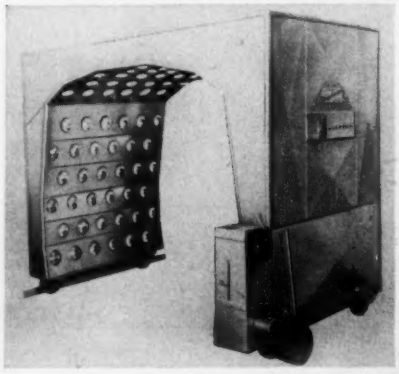
the motor coinciding with the centerline of the low-speed shaft. The gear housing is a one-piece casting with all four feet in the same casting. The Motorgear is suitable for horizontal mounting, preferably on a level floor, but provisions can be made for other mountings, provided shafts remain horizontal.

Check No. 4 on Reply Card for more Details

Paint Drying Oven

Kellogg Division of American Brake Shoe Co., 230 Park Ave., New York 17, N. Y., is offering the Auto-Bake mobile infra-red paint drying oven which can be used for drying either lacquers or enamels, but which is intended primarily for use on synthetic enamels which are slow in air



drying. Unit is of rigid, light weight construction and has pushbutton control, automatic stop and lamp shut-off and a variable speed drive.

Unit travels over the item being painted, rolling on rubber-tired, roller bearing wheels. For touch-up work, individual baking zones are controlled by six selective switches. Driving mechanism consists of a fractional horsepower electric motor, variable speed transmission and a gear reduction unit. The oven contains 120 internal reflector infra-red heat lamps.

Check No. 5 on Reply Card for more Details

Speed Transmissions

Infinitely variable speeds within wide ranges may be provided with the Specon MD transmission, developed by Speed Control Corp., Wickliffe, O. The unit consists of a mechanical differential attached to a standard Link-Belt PIV unit. The four models offered provide any desired speed, either forward or reverse, between 0 and 7000 revolutions per minute.

Output torque from 20 inch-pounds (minimum speed) to 15,460 inch-pounds (maximum speed) is also available. Net output horsepower varies in different models and speeds

BRANDT of Baltimore—still expanding to meet industry's ever growing need for exacting metal work—has recently stepped up production on a jumbo job for one of America's largest automobile manufacturers. This job involves huge stampings, welding, and forming operations. Here, Brandt puts the TON in producTiON with a battery of giant presses. All along the line, Brandt joins skilled mechanics with highly flexible facilities to meet precise specifications with on-the-dot scheduling . . . . In metal work . . . when it's gotta fit. . . . Brandt measures up!

CHARLES T. BRANDT, INC. — 1700 RIDGELY ST. — BALTIMORE 30, MD.

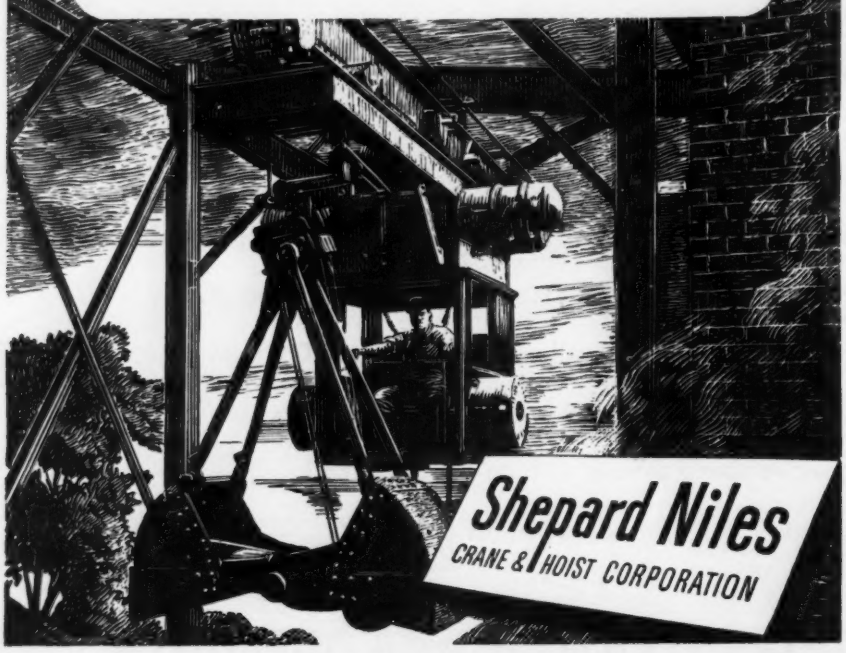
Going on a TRIP?

By motoring standards a trip of less than 100 feet is ridiculous, yet one such trip involving the moving of heavy materials around your plant by human muscle can easily cost more than a coast-to-coast automobile tour.

When material-moving costs must be kept down, when speed is important, when safety is concerned and when day-in, day-out, trouble free operation is required — the answer is a Shepard Niles monorail hoist. And the recommendation of a trained, experienced Shepard Niles engineer is invaluable in helping you get the electric hoist best suited to **your** needs.

His survey of your material handling puts you under no obligation. America's oldest builder of electric hoists has a wealth of experience from which to draw. All this experience is at your service, to help you get what you need.

★ Perhaps your problem involves an overhead traveling crane, rather than a hoist. If a crane will do a better job for you, that's what Shepard Niles engineers will recommend.



Shepard Niles
CRANE & HOIST CORPORATION

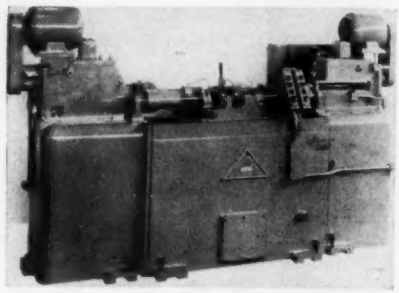
358 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

from 1 to 20. Desired speed is set by a handwheel and indicated on a large dial. A vernier dial may be provided for extremely close speed settings.

Check No. 6 on Reply Card for more Details

Drilling Machine

Built by LeMaire Tool & Mfg. Co., 2657 South Telegraph Rd., Dearborn, Mich., the 2-way, 4-spindle horizontal drilling machine consists of a rigidly fabricated steel center base with two end bases, on each of which is mounted a No. 1000 hydraulic unit driving and feeding a 2-spindle head. The head is mounted on guide bars with



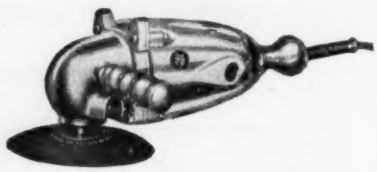
the forward end of the bars supported by brackets which are an integral part of the fixture.

Fixture is arranged to hold two parts (steering idler arms) and at each cycle of the machine 0.182-inch holes are drilled in opposite sides of a yoke on each of the two arms. Coolant is provided from a tank built into the machine's base. Production is about 300 pieces per hour. Feed rate is 135 inches per minute and slow feed may be varied from ½ to 35 inches per minute by a dial.

Check No. 7 on Reply Card for more Details

Heavy Duty Sander

The 7-inch high speed heavy duty sander, developed by United States Electrical Tool Co., Cincinnati 14, O., is amply powered for metal finishing, removing scale and rust with



wire brush and for smoothing welds and casting ridges with cup grinding wheel. Straight-line ventilation assures cool motor operation. An air outlet diverts dust-laden air away from the operator. A flexible rubber pad adapts the sander to curved or flat surfaces.

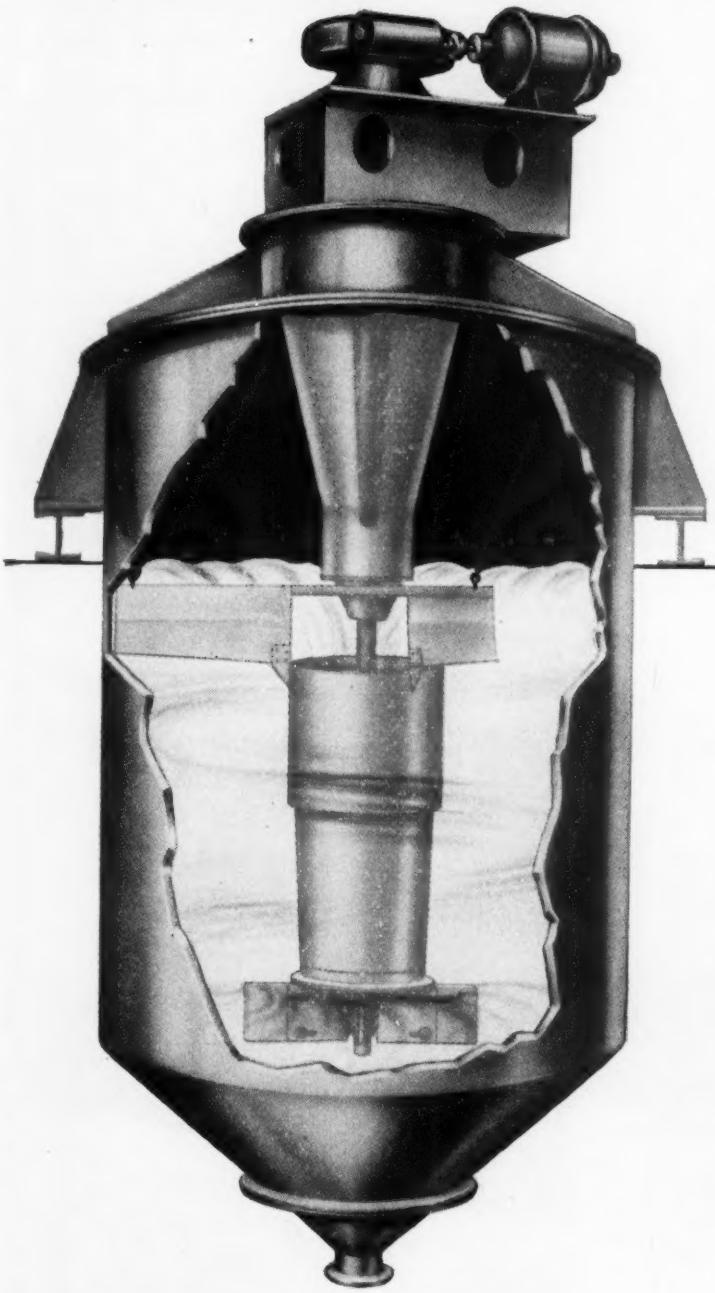
A ball type rear handle and a thumb operated switch add to ease

Important Announcement

KOPPERS CAN DESIGN, CONSTRUCT AND INSTALL THE

REVOLUTIONARY

GOLDMAN AGITATOR



● The Goldman Agitator — that has revolutionized mixing methods in Europe—is now available in this country. The Koppers Engineering Staff can design, construct and install a Goldman Agitator that will meet your specific requirements.

Ingeniously designed — entirely new in principle — the Goldman Agitator mixes liquids violently, rapidly and thoroughly — in a fraction of the time required by conventional mixers. And by greatly reducing the mixing time, power consumption is sharply cut.

Koppers invites your inquiries.

KOPPERS COMPANY, INC.

Engineering and Construction Division

Pittsburgh 19, Pa.

KOPPERS

of operation. Switch commutator and brushes are fully protected against abrasive dust and grit. Ball bearing-equipped, the machine's heat treated alloy steel gears are in a grease tight case. Operation is on direct or alternating current, 25 to 60 cycle, 110 volts. It is also available for 220 and 250 volts. No-load speed of the 7-inch sanding pad is 5000 revolutions per minute.

Check No. 8 on Reply Card for more Details

Tapping Attachment

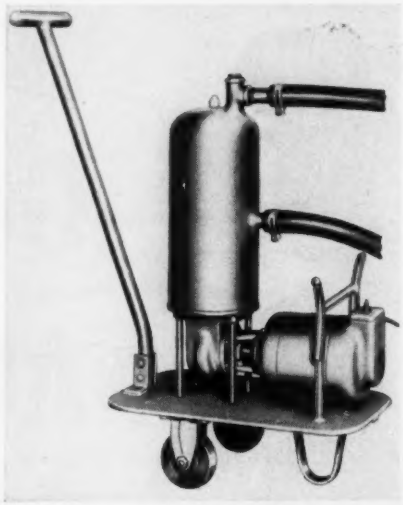
Designed to eliminate tap breakage, a new tapping attachment, the Jay-Dee, made by Wickman Mfg. Co., 15533 Woodrow Wilson Ave., Detroit 3, Mich., uses a resilient material to deliver a safe cutting torque and protect taps, regardless of load. The attachment can be used with all types of reversible machines, for horizontal or vertical tapping, for blind and through holes.

Four index stations, listed according to tap size on the body of the attachment, can be quickly selected. Tap changing takes 5 seconds. Tap adaptors are supplied for various size taps, being inserted in the master collet and held in place by spring buttons. Three models are offered, all with Morse taper shanks: Model K-1, with a ½ to 1¾-inch USS range; model K-2, ⅜ to 1¼-inch USS range; model K-3, 3/16 to ½-inch USS range.

Check No. 9 on Reply Card for more Details

Portable Pump

Ruthman Machinery Co., Cincinnati 2, O., is manufacturing a portable pump unit designed for transfer of



liquids and for rapid removal of coolants from machine tool reservoirs and sumps. Unit consists of a Rumaco model 4C pump with internal discharge features, installed in combination with a shell type reprime chamber, with direct communication discharge and inlet.

Pump is mounted on a fabricated steel truck which has rubber tired casters for quick and easy moving. The model R unit has a ¾-horsepower, 3450 revolutions per minute motor, available in standard voltages. It is supplied with two 10-foot lengths of 1¼-inch inside diameter solvent hose and suction nozzle. Capacity is 40 gallons per minute at 15 foot difference in level.

Check No. 10 on Reply Card for more Details

Filters

Filters constructed of Saran-lined steel pipe and fittings and rubber-lined filter and precoat tank are being announced by Titeflex Inc., 531 Frelinghuysen Ave., Newark 5, N. J. The series SLA filters can be used in plating and chemical industries where corrosive liquids are handled. They can be used at temperatures between 0 and 180° F for general service.

Filters have a rigid synthetic membrance of porous stone to support a filtering medium called "filter aid".

A Complete Warehouse Service for...
SHEETS • PLATES
STRIP • STAINLESS STEEL
TIN PLATE • BARS • SHAPES
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ONE OF THE NATION'S
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ESTABLISHED 1866

THE WHELAND COMPANY

FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS

CHATTANOOGA 2, TENNESSEE

Cleaning is accomplished by a method of backwashing. The filters are operated by turning a few valves and are almost completely automatic. Suspended particles down to 1/10th of a micron are removed.

Check No. 11 on Reply Card for more Details

Gear Tester

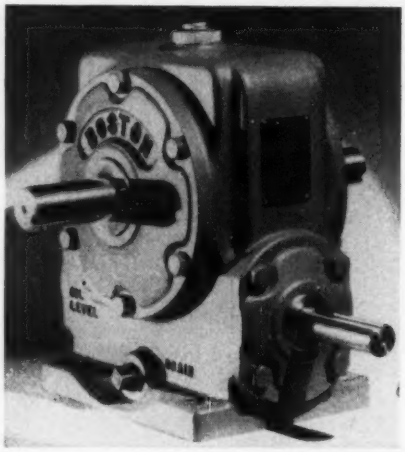
George Scherr Co. Inc., 200 Lafayette St., New York 12, N. Y., is announcing a new model A 4½-inch Parkson gear tester for spur, worm and bevel gears which has an adjustment of its moveable slide by means of a lead screw and crank handle to facilitate the delicate, fine adjustment for center distances. In addition to its ball bearing floating carriage, it has a new feature which permits rotating of the spindle on the floating slide by a crank handle. When this is used a hardened master gear is permanently mounted on the rotating spindle.

It is possible to reverse the measuring pressure for the purpose of inspecting the internal gears. A 2½-inch long vernier is standard equipment. An autograph recording device can be furnished for the tester when it is used for spur or helical gears. With it movement of the floating carriage is amplified 50 times and traced on a waxed disk. Maximum center distance is 4½-inches and minimum center distance is 1 inch.

Check No. 12 on Reply Card for more Details

Speed Reducer

Heavier gearing which gives an increased horsepower rating is a feature of the type TAN speed reducer announced by Boston Gear Works,



Quincy 71, Mass. The worm is made integral with its shaft to add ruggedness and reduce the number of parts. Larger shafts permit greater loads and a one piece housing provides a greater area for heat radiation.

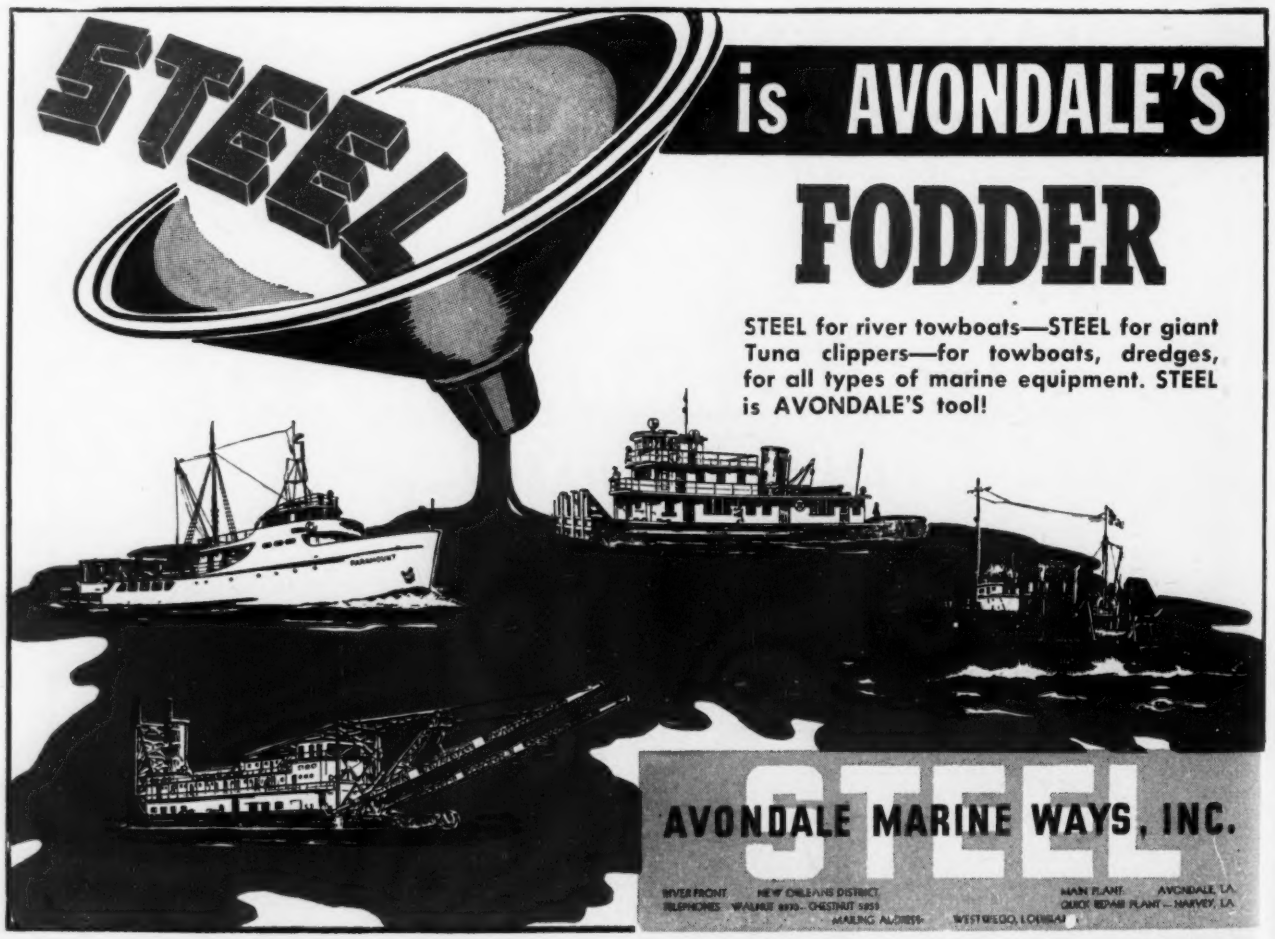
Improved oil seals minimize oil leakage and reduce the friction of the seals on the shaft. A vent valve incorporated in the filler plug permits the unit to breath, at the same time keeping out foreign matter. Except for shaft sizes, the new Reductor is completely interchangeable with the present TA unit which it supplants, having the same shaft center and mounting dimensions.

Check No. 13 on Reply Card for more Details

Carbide Tools

An expanded line of Kennamatic tools, made by Kennametal Inc., Latrobe, Pa., has indexable and replaceable solid Kennametal cemented carbide inserts, square or triangular, mechanically held in vertical position. Six different styles having triangular inserts are stocked, supplied with carbide grade K2S, K3H or K6 inserts, in sizes from ¾-inch square to 1 x 1½-inches. Two sizes are stocked in sizes with the same grades in sizes from ¾ to 1½-inches.

These tools offer extended tool life, because inserts are mechanically held vertically, longer service between grinds, better tool control and re-


STEEL
is AVONDALE'S
FODDER
STEEL for river towboats—STEEL for giant Tuna clippers—for towboats, dredges, for all types of marine equipment. STEEL is AVONDALE'S tool!
STEEL
AVONDALE MARINE WAYS, INC.

One of a series *of messages to help you increase your understanding of business paper advertising, and its effect on your job.*

Who pays your company's advertising bill ?

PEOPLE WHO REGARD advertising as an economic waste are fond of pointing out that it's the *customer* who pays the bill.

And they are right.

The customer also pays for your power supply, your production tools, your plant maintenance, your salaries. All these are figured into the price of your product, along with the cost of your advertising.

Does this mean that the customer pays *more* for your product because it is advertised? Not at all. No more than he pays anything "extra" for the machinery on your production line!

The truth is, your production tools enable you to *reduce* your manufacturing cost-per-unit — and hence your price to the customer.

Advertising works the same way. For it is simply the application of assembly-line methods to the *manufacture of a sale.*

How can selling be mechanized? Just consider the five basic steps —

1. **Seeking out prospects**
2. **Arousing their interest**
3. **Creating a preference for your product**
4. **Making a specific proposal**
5. **Closing the order**

Advertising performs the first three of these jobs. And it performs them *far more economically* than any other means, leaving your salesmen free to concentrate their valuable time on the two jobs they alone can do, and do best.

As with any other capital investment, the yield from advertising depends on how *efficiently* it is put to work. But this much you can be sure of: nowhere does advertising work more efficiently than in business papers, with their tremendous concentration of hand-picked readers. Nowhere will your advertising dollar go so far toward reducing the cost of *manufacturing a sale!*

STEEL

is a member of The Associated Business Papers, who have published an interesting folder entitled, "10 ways to measure advertising effectiveness." We'll be glad to send you a copy. And if you'd like reprints of this advertisement (or the entire series) to pass along to others in your organization, just say the word.

duced tool room stocks, simplified regrinding and less set-up and machine down time.

Check No. 14 on Reply Card for more Details

Oven Temperature Tester

Performance and efficiency of heating appliances can be tested with the portable oven temperature tester announced by Meter and Instrument Divisions of General Electric Co., Schenectady 5, N. Y. The instrument, designated at type DO-50, is a sensitive direct current millivoltmeter calibrated for use with iron

copnic (constantan) thermocouples having a resistance of 2 ohms.

It can be used to check ovens, control processing or heat equipment and various appliances. The tester consists of a 3½-inch panel instrument mounted in a case with a compartment for storing thermocouple assembly and leads. With a scale range from 0 to 650° F, the instrument has an accuracy of plus or minus 5 per cent of full-scale value.

Check No. 15 on Reply Card for more Details

Solenoid Valve

Designed for emergency or safety requirements, the 150 pound globe type solenoid valve, made by Johnson Corp., Three Rivers, Mich., is intended for service in which the valve is normally open. The series No. 6000 valve is capable of remaining closed for indefinite periods of time. Since the valve closes with pressure and flow, it will remain closed as long as a pressure above 3 pounds exists on the inlet side, regardless of whether or not the solenoid continues to be energized.

A ⅛-inch pipe, branching from the main inlet pipe, by-passes the inlet side of the valve and leads directly into the chamber on the outlet side, permitting easy opening once the emergency has passed. Flow through this pipe is controlled by a ⅛-inch globe valve. Valve is suitable for pressures up to 150 pounds in steam, hot or cold water, gas, air, gasoline or oil. Six sizes from ¾ to 2½-inches are made for operation on various voltages.

Check No. 16 on Reply Card for more Details

Diamond Setter

Using the Qualiset diamond setter, made by K-E Industries, 253 Plymouth Bldg., Minneapolis 2, Minn., manufacturers using diamond tools can make their own tools at a low cost. The machine operates on 110 volt alternating current and is capable of setting a diamond in less than 2 minutes. Its simplicity of operation makes it possible for anyone to learn to operate it efficiently in a few minutes. Cost is such that even small plants that use no more than $1000 worth of diamond tools per year can save the machine's cost in a short time.

Check No. 17 on Reply Card for more Details

• • •

HOLDERS: New holders designed primarily for relatively shallow hole operations in turret lathes are announced by Eclipse Counterbore Co., Detroit, Mich. Series consists of four sizes. Body of stub core drill holder is without flutes and approximately one-half the length of the conventional fluted types which are used for bushing guided deep hole operations.

Check No. 18 on Reply Card for more Details

INSULATION TESTERS: Herman H. Sticht Co. Inc., New York, N. Y., offers new light weight insulation testers. The instrument is of the hand crank type, having a direct current generator with a 500 volt direct current output. Measuring system is of the true ohmmeter cross coil type; scale range is 0-50 megohms and infinity.

Check No. 19 on Reply Card for more Details

AIR METER: A new three-way air meter, designated as Anemotherm, is announced by Anemostat Corp. of America, New York, N. Y. It gives air velocity, air temperature and static pressure readings at the turn of a knob. The unit operates on self-contained batteries.

Check No. 20 on Reply Card for more Details

ELECTRONIC AIR FILTER: The Electro-PL, an electronic air filter, has been developed by American Air Filter Co. Inc., Louisville, Ky., with an intermediate cleaning efficiency for applications where efficiency of a mechanical filter is too low and that of an electronic precipitator is unnecessarily high. The new filter is basically an electronic precipitator without an ionizing unit and contains a collector element of electrostatically charged Airmat paper.

Check No. 21 on Reply Card for more Details

PUMP OILER: Dubl-A pump oiler with a flexible spout, No. 27F, is offered by Atlas-Ansonia Co., North Haven, Conn. Features of this oiler include a solid brass screw and collar with machine cut threads; cylinder of seamless steel tubing; piston of solid brass, accurately fitted to cylinder to very close tolerances; and a simplified pumping action that delivers a powerful stream (30 feet vertically into the air) or a few drops.

Check No. 22 on Reply Card for more Details

ALUMINUM PAINT: Aluminum Industries Inc., Cincinnati 25, O., announce Permite special exterior heat-resisting aluminum paint No. 1901, for use on outdoor boilers, steam pipes, smoke stacks, manifolds, engine heads, etc. It will resist heat up to 1000° F and will not blister and peel off when rains hit the extremely hot surfaces.

Check No. 23 on Reply Card for more Details

AIR VALVE: A new three-way air valve developed by Mead Specialties Co., Chicago, Ill., is offered in two models, FT-101 and FC-101 and have minimum openings of $\frac{5}{16}$-inch throughout. They are fitted with hose nipples to take ⅜-inch inside diameter and ¾-inch outside diameter hose. Mounting holes are at both top and sides of the rectangular valve body.

Check No. 24 on Reply Card for more Details

SMOKE DENSITY RECORDER: An electronically operated smoke density recorder which accurately measures and records the density of smoke or dust in flues or ducts has been developed by Bailey Meter Co., Cleveland 10, O. Instrument consists of the company's standard electronic recorder, a Bolometer type smoke detector and a sealed beam light source.

Check No. 25 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

DEMAND—Steel demand, already far ahead of supply, continues to grow, and there are no indications of an immediate weakening. One of the first signs of decline probably will be an easing in demand for conversion ingots, but as yet the pressure for them is undiminished. They constitute an even more sensitive barometer than the gray market, for finished steel resulting from them is far above mill prices and it is mainly "blue chip" companies which also have mill sources of supply of finished steel that take the bulk of conversion ingots. Consequently, it is logical to expect these companies to show buyer resistance first to conversion ingots, even before small consumers with only the gray market as a supply source can shun high-priced material.

With production in many instances failing to come up to expectations and with emergence of voluntary allocations programs a considerable tonnage will be represented in unfilled 1948 orders. In view of this and the uncertainty as to the future of voluntary allocations programs, many producers are being cautious in opening books for next year.

Meanwhile, however, there is conjecture as to whether the freight car builders, now taking half of all steel allocated, will ease their requirements if the low level to which new car ordering dropped in September continues.

PRODUCTION—Continuing to edge upward for the fourth consecutive week and rising one-half point, steel ingot production, reached 99 per cent of capacity last week and set another peacetime record, only slightly below the all-time peak hit during the war.

CAPACITY—Another step in the current move to increase the nation's steel ingot capacity is announcement by Jones & Laughlin Steel Corp., Pittsburgh, that it will launch a $70 million program that will include replacement of ten old open hearths with six new ones, giving a net increase of 400,000 tons of capacity.

PRICES—Upward adjustments of prices continued last week. Reflecting the recent increase in the price of zinc, several companies advanced galvanized pipe $1 a ton and one producer raised hot-dipped and galvannealed sheets from 3 to 12c a hundredweight, depending on gage. Other producers are expected to follow suit. As result of recent increases in nickel and ferroalloys, the move made recently by one leading company in revising alloy prices upward has been followed by another important producer.

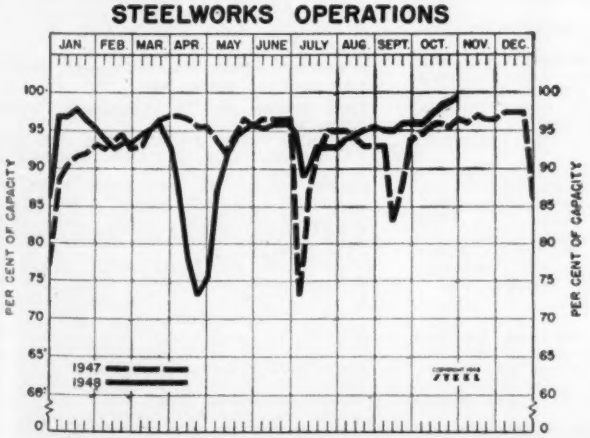
STEEL's composite price averages last week, however, held unchanged from the preceding week, and compared with those for the like 1947 week are: Finished steel, $95.05 and $75.41; semifinished steel, $75.75 and $56.80; steelmaking pig iron, $46.29 and $36.38; and steelmaking scrap, $43.25 and $40.25.

WAREHOUSES—Stocks of most products are inadequate at warehouses, and because of increasing momentum in the voluntary allocations programs there appears little hope for any near-term improvement in warehouse receipts from mills. Warehouses last week were marking up prices on alloy bars in line with recent mill increases in grade extras.

SCRAP—Demand for open-hearth scrap remains undiminished, although several large steel producers are reported to be in a much more comfortable supply position for entering the winter than was the case this time last year, and there are fewer reports of scrap sales at over-the-formula prices. Substantial tonnages of foreign scrap were being unloaded last week on the eastern seaboard.

PIG IRON—Merchant pig iron continues in extremely strong demand, fostering the importation of high-priced foreign iron. However, it was thought imports may decline when a New England furnace comes back into operation soon. In line with recent pig iron price advances, a producer of open-hearth and foundry grade silvery iron announced a $3-a-ton raise.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended Oct. 30	Change	Same Week 1947	Same Week 1946
Pittsburgh	97	+ 1	104	98.5
Chicago	99.5	+ 1	94.5	92.5
Eastern Pa.	95	None	92	78
Youngstown	104	None	92	91
Wheeling	90	— 1	93.5	81.5
Cleveland	99	None	92.5	89
Buffalo	104	None	88.5	88.5
Birmingham	100	None	99	99
New England	87	None	86	90
Cincinnati	104	+ 1	94	88
St. Louis	89.5	None	80	65.5
Detroit	101	None	86	91
Estimated national rate	99	+ 0.5	96.5	91

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Oct. 30	Oct. 23	Month Ago Sept. 1948	Year Ago Oct. 1947	5 Years Ago Oct. 1943
Finished Steel	$95.05	$95.05	$95.05	$75.41	$56.73
Semifinished Steel	75.75	75.75	75.75	56.80	36.00
Steelmaking Pig Iron	46.29	46.29	44.39	36.18	23.00
Steelmaking Scrap	43.25	43.25	43.33	39.85	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Sept. 1948	4.12679c
Aug. 1948	4.14340c
July 1948	4.06995c
Sept. 1947	3.45716c
Sept. 1943	2.44293c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†**FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. September, 1948, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, wire rods, cents per lb; semifinished (except wire rods) and coke, dollars three months and one year ago. Finished material (except tin plate) and per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Oct. 30, 1948	Sept., 1948	July, 1948	Oct., 1947
Steel bars, Pittsburgh mills	3.45c	3.45c	3.105c	2.90c
Steel bars, del. Philadelphia	3.79	3.79	3.545	3.301
Steel bars, Chicago mills	3.35	3.35	3.065	2.90
Shapes, Pittsburgh mills	3.275	3.275	2.975	2.80
Shapes, Chicago mills	3.25	3.25	2.965	2.80
Shapes, del. Philadelphia	3.48	3.48	3.18	2.947
Plates, Pittsburgh mills	3.50	3.50	3.155	2.95
Plates, Chicago mills	3.40	3.40	3.115	2.95
Plates, del. Philadelphia	3.71	3.71	3.41	3.162
Sheets, hot-rolled, Pittsburgh mills	3.275	3.275	2.975	2.80
Sheets, cold-rolled, Pittsburgh	4.00	4.00	3.70	3.55
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.10	3.90
Sheets, hot-rolled, Gary mills	3.25	3.25	2.965	2.80
Sheets, cold-rolled, Gary mills	4.00	4.00	3.70	3.55
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.10	3.90
Strip, hot-rolled, Pittsburgh mills	3.50	3.50	3.140	2.80
Strip, cold-rolled, Pittsburgh mills	4.375	4.375	3.965	3.55
Bright basic, wire, Pittsburgh	4.325	4.325	3.965	3.675
Wire nails, Pittsburgh mills	5.775	5.775	5.255	4.25
Tin plate, per base box, Pitts. dist.	$6.70	$6.80	$6.74	$5.75

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$62.80	$53.57
Slabs, Chicago	52.00	52.00	47.80	40.18
Rerolling billets, Pittsburgh	59.00	59.00	47.80	40.18
Wire rod ⅜ to ¼-inch, Pitts. dist.	3.775c	3.775c	3.415c	2.925c

* Nominal.

Pig Iron

	Oct. 30, 1948	Sept., 1948	July, 1948	Oct., 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$44.08	$38.879
Basic, Valley	46.00	43.00	40.60	36.00
Basic, eastern del. Philadelphia	50.17	47.77	43.77	38.78
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	43.58	37.879
No. 2 fdry., del. Philadelphia	50.67	48.27	44.27	39.28
No. 2 foundry, Chicago	44.75	43.25	41.10	36.00
No. 2 foundry, Valley	46.50	43.50	41.10	36.50
Southern No. 2 Birmingham	43.38	43.38	40.72	34.88
Southern No. 2 del. Cincinnati	49.09	49.09	46.43	38.544
Malleable, Valley	46.50	43.50	40.30	36.50
Malleable, Chicago	45.00	43.50	41.50	36.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	62.00	59.60	46.40
Ferromanganese, fob Aetna, Pa.	163.00	148.00	151.15*	151.00*

* F.o.b. cars Pittsburgh.

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$42.75	$42.75	$40.75	$39.90
Heavy melt. steel, No. 2, E. Pa.	41.50	41.50	40.00	39.50
Heavy melt. steel, No. 1 Chicago	41.75	41.75	40.05	39.55
Heavy melt. steel, No. 1 Valley	42.75	42.75	40.75	39.50
Heavy melt. steel, No. 1, Cleveland	42.25	42.25	40.25	38.25
Heavy melt. steel, No. 1 Buffalo	48.25	48.15	44.30	39.00
Rails for rerolling, Chicago	64.50	64.50	57.80	51.00
No. 1 cast, Chicago	70.50	71.10	66.50	46.40

Coke

Connellsville, beehive furnace	$14.50	$14.50	$14.25	$12.15
Connellsville, beehive foundry	17.00	17.00	17.00	14.50
Chicago, oven foundry, ovens	20.40	20.40	19.86	17.50

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $100-105 per gross ton. Forging quality $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except $62, Conshohocken, Pa.; $66, Monessen, Pa.; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $68, Conshohocken, Pa., mill.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill, except: $70, Conshohocken, Pa.

Sheet Bars: $67 nom., per net ton, mill; sales in open market $110-$115 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill; some sellers quoting up to $120 per gross ton.

Wire Rods: Basic and acid open-hearth, 7/32 & ½-inch, inclusive, 3.40c per lb, mill, except: 3.65c, Struthers, O.; 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Portsmouth, O., Los Angeles; 4.15c, Monessen, Pa. One producer quotes 3.90c, Chicago base. Basic open-hearth and bessemer, not resulphurized, 7/32 to 47/64-inch, inclusive, 3.50c, mill.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): 3.35c, mill, except: 3.55c, Ecorse, Mich., Pittsburgh, Monessen, Aliquippa, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif., Portland, Oreg., Atlanta, Seattle; 4.20c, Kansas City, Mo.; 4.25c, Minnequa, Colo.; 5.30c, Fontana, Calif.

Rail Steel Bars: (Base 10 tons): 3.35c, Moline, Ill.; 4.80c, Williamsport, Avis, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 5.50c, Fontana, Calif.

Hot-Rolled Alloy Bar Shapes: 4.00c, mill.

Cold-Finished Carbon Bars (Base 20,000-39,999 lb): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.25c, Monessen, Pa.; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.36c, Plymouth, Mich.; 4.40c, Newark, N. J., Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.45c, Camden, N. J.; 5.30c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.75c, Monessen, Pa.; 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.40c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.55c, Monessen, Pa.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, Atlanta, Seattle, S. San Francisco, Los Angeles; 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.10c, Pittsburgh; 4.25c, S. Duquesne, Pa., Gary, Ind., Youngstown; 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 4.65c, Williamsport, Pa., mill; 5.25c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa., 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18 gage and heavier): 3.25c, mill, except: 3.25-3.30c, Cleveland; 3.30c, Pittsburgh; 3.45c, Ecorse, Mich.; 3.95c, Pittsburg, Torrance, Calif.; 5.00c, Conshohocken, Pa.; 5.65c, Fontana, Calif.; 6.25c, Kansas City, Mo.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 4.65c, Niles, O., 5.05c, Torrance, Calif., Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Granite City, Ill., Ecorse, Mich., 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill, except: 5.00c, Niles, O.; 5.15c, Pittsburg, Torrance, Calif.; 5.30c, Kokomo, Ind.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Indiana Harbor, Ind.; 5.55c, Niles, O.; 5.70c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc) 5.00c, mill, except: 5.40c, Granite City, Ill.; 5.45c, Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Copper-Iron: 5.75c, Granite City, Ill.; 5.35c, Irvin, Pa., Gary, Ind.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: 7.75c, Butler, Pa.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c, mill, except: 4.60c, Granite City, Ill.; 4.70c, Ecorse, Mich.; 6.00c, Niles, O.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill, except: 6.05c, Niles, O.

Electrical: Hot-rolled, 5.95c, mill, except: 6.05c, Kokomo, Ind.; 6.15c, Granite City, Ill.; 6.55c, Niles, O.

Motor: 6.70c, mill except: 6.90c, Granite City. Dynamo: 7.50c, mill, except: 7.40c, Follansbee, W. Va., Toronto, O.; 7.70c, Granite City, Ill. Transformer 72, 8.05c, mill, except: 7.90c, Follansbee, W. Va., Toronto, O. 65, 8.60c, mill. 58, 9.30c, mill. 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., and Conshohocken, Pa., mills.

Galvanized (No. 10), 6.75c, mill.

Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.30c, Cleveland, Pittsburgh, Riverdale, Ill.; 3.25-3.35c,* Sharon, Pa.; 3.45c, Ecorse, Mich., Atlanta; 3.60c, Detroit; 3.70c, West Leechburg, Pa.; 4.00c, Pittsburg, Torrance, Calif.; 4.25c, Seattle, S. San Francisco, Los Angeles; 4.20c, Kansas City, Mo.; 4.30c, Minnequa, Colo.; 5.90c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

* Wider than 6-in. and 6-in. and narrower, respectively.

Cold-Rolled Strip (0.25 carbon and less): 4.00c, mill, except 4.00-4.25c, Warren, O.; 4.00-4.50c, Youngstown; 4.20c, Ecorse, Mich.; 4.25c, Riverdale, Ill.; 4.40-4.50c, Detroit; 4.50c, New Haven, Conn., West Leechburg, New Castle, Pa., Boston; 4.75c, Dover, O., New Kensington, Pa.; 4.50-5.00c, Trenton, N. J.; 4.80-5.05c, Wallingford, Conn.; 5.75c, Los Angeles; 7.10c, Fontana, Calif. One company quotes 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base; another, 5.00c, Pittsburgh base.

Cold-Rolled Alloy Strip: 9.50c, mill, except 9.80c, Worcester, Mass.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.25c, Ecorse, Mich., mill. Cold-rolled, 6.05c, mill, except: 6.35c, Ecorse, Mich., mill.

Tin, Terne Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $6.60-$6.80; 1.50 lb coating $6.80-$7.00. Pittsburg, Calif., mill $7.35 and $7.55, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb, 0.25 lb tin, $5.80-$6.00; 0.50 lb tin, $6.00-$6.20; 0.75 lb tin, $6.20-$6.40.

Can Making Black Plate: Per base box of 100 lb, 55 to 70 lb basis weight, $5.20-$5.30; 75 to 95 lb basis weight $5.10-$5.20; 100 to 128 lb basis weight, $5.20-$5.30. $5.75-$5.95, $5.65-$5.85, $5.75-$5.95, respectively, Pittsburg, Calif.

Holloware Enameling Black Plate: 29-gage, 4.75c per pound, except: 4.85c, Sparrows Point, Md.; 4.95c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $5.90, except $6 Fairfield, Ala.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $15.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.40-3.60c, Cleveland; 3.45c, Sparrows Point, Md., Johnstown, Pa., Lackawanna, N. Y.; 3.60c, Pittsburgh; 3.65c, Ecorse, Mich.; 3.75c, Coatesville, Pa.; 3.95c, Claymont, Del., Conshohocken, Pa.; 4.30c, Seattle, Minnequa, Colo.; 4.56c, Houston, Tex.; 5.80c, Fontana, Calif.; 6.50c, Harrisburg, Pa.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 5.10c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.10c, Coatesville, Pa.; 5.30c, Conshohocken, Pa., Sparrows Point, Md., Johnstown, Pa.; 5.65c, Ecorse, Mich., Sharon, Pa.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Pa., Lackawanna, N. Y., Johnstown, Aliquippa, Pa.; 3.85c, Torrance, Calif.; 4.15c, Minnequa, Colo.; 4.30c, Seattle, S. San Francisco, Los Angeles; 5.75c, Fontana, Calif.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.00c, Atlanta; 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Mass.; 4.50c, Monessen, Pa., Minnequa, Colo., Buffalo; 4.70c, Portsmouth, O.; 4.80c, Palmer, Mass.; 5.10c, Pittsburg, Calif.; 5.15c, So. San Francisco; 5.40c, Shelton, Conn. One producer quotes 4.50c, Chicago base; another, 4.50c, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Basic MB Spring Wire, 5.55c, mill, except: 5.30c, Portsmouth, O.; 5.65c, Sparrows Point, Md., Monessen, Pa.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J., 6.50c, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., Williamsport, Pa.; 5.50c, Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill, except: 4.90c, Sparrows Point, Md., 4.95c, Monessen, Pa.; 5.10c, Worcester, Mass.; 5.15c, Minnequa, Colo., Kokomo, Ind.; 5.20c, Atlanta; 5.75c, So. San Francisco, Pittsburg, Calif. One producer quotes 5.15c, Chicago and Pittsburgh base; another, 5.20c. Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Galvanized (6 to 8 Gage base), 5.25c, mill, except: 5.35c, Sparrows Point, Md.; 5.40c, Monessen, Pa.; 5.55c, Worcester, Mass.; 5.60c, Kokomo, Ind., Minnequa, Colo.; 5.65c, Atlanta; 6.20c, Pittsburg, So. San Francisco, Calif. One producer quotes 5.60c, Pittsburgh and Chicago base; another, 5.65c, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Column 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind.; 109 Worcester, Mass.; 110 Minnequa, Colo., Atlanta; 117, Portsmouth, O.; 123, Pittsburg, Calif.; 124, Cleveland; 126, Monessen, Pa.; $5.20 per 100 pound keg, Aliquippa, Pa.; $6.75, Conshohocken, Pa., Wheeling, W. Va. One producer quotes column 109, Chicago and Pittsburgh base; another, column 113, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Woven Fence (9 to 15½ Gage, inclusive): Column 109, mill, except: 113 Monessen, Pa., Kokomo, Ind.; 116, Minnequa, Colo.; 121 Atlanta; 132, Pittsburg, Calif. One producer quotes column 113, Pittsburgh and Chicago base; another, column 114, Crawfordsville, Ind., freight equalized with Pittsburgh and Birmingham.

Barbed Wire: Column 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind.; 126 Atlanta; 128 Monessen, Pa.; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, So. San Francisco. One producer quotes 127, Chicago and Pittsburgh base.

Fence Posts (with clamps): Column 114, Duluth; 115, Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $123.50 per net ton, Williamsport, Pa.

Bale Ties (single loop): Column 106, mill, except: 108, Sparrows Point, Md., Kokomo, Ind.; 110, Atlanta; 113 Minnequa, Colo.; 130, So. San Francisco, Pittsburg, Calif. One producer quotes column 115, Crawfordsville, Ind., freight equalized with Birmingham and Pittsburgh.

Tubular Goods

Standard Steel Pipe: Mill prices in carlots, threaded and coupled, to consumers about $200 a net ton.

In		Butt Weld Blk.	Butt Weld Gal.	In		Butt Weld Blk.	Butt Weld Gal.
⅛	....	41½	12– 12½	1¼	...	46½– 49	27½– 30
¼	....	39½	13½– 14	1½	...	47– 49½	28– 30½
⅜	....	36	8½– 9	2	.....	47½– 50	28½– 31
½	....	40½– 43	20– 22½	2½, 3..		48– 50½	29– 31½
¾	....	43½– 46	24– 26½	3½ & 4		44½	27.5
1	.....	46– 48½	27– 29½				

In		Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	....	39½	19½– 20	38½	18½	27– 38½	7½ 19
2½	..	42½– 43½	22½– 24	41½	21½	32½– 41½	13– 22
3	....	42½– 43½	22½– 24	41½	21½	35– 41½	15½– 22
3½ & 4		42½– 46½	23– 27	43½	23½	38½– 43½	19– 24
5 & 6.		42½– 44½	23– 24½	43½	23½	38½– 43½	19– 24
7	....	....	..	....	..	43½	22½

Line Steel Pipe: Mill prices in carlots to consumers about $200 a net ton.

In		Butt Weld Blk.	Butt Weld Gal.	In		Butt Weld Blk.	Butt Weld Gal.
⅛	....	40½	....	1¼	...	47– 48	28– 29
¼	....	38½	....	1½	...	47½– 48½	28½– 29½
⅜	....	35	....	2	.....	48– 49	29– 30
½	....	41– 42	20½– 21½	2½ & 3		48½– 49½	29½– 30½
¾	....	44– 45	24½– 25½	3½ & 4		43½	
1	.....	46½– 47½	27½– 28½				

In		Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	....	38½	19	37½	18	26– 37½	6½– 18
2½	..	41½– 42½	23	40½	21	31½– 40½	12– 21
3	....	41½– 42½	23	40½	21	34– 40½	14½ 21
3½-4	.	41½– 45½	22– 26	42½	23	37½– 42½	18– 23
5 & 6	..	41½– 43½	22	42½	23	37½– 42½	18– 23
8	....	45½	..	44½	24	40½– 44½	20– 24
10	...	45	..	44	23½	41½– 44	21– 23½
12	...	44	..	43	22½	40½– 43	20– 22½

Standard Wrought Iron Pipe: Mill price in carlots, threaded and coupled, to consumers about $200 a net ton.

In.	Butt Weld Bulk.	Butt Weld Gal.	In.	Lap Weld Bulk.	Lap Weld Gal.
⅜...	+59½	+93	1¼..	+22	+50½
½...	+20½	+50	1½..	+15½	+43
¾...	+10½	+39	2....	+ 7½	+24
1 and 1¼	+ 4½	+30	2½-3½	+ 5	+29½
1½..	— 1½	+26½	4....	List	+23½
2....	— 2	+26	4½-8	+ 2	+25
			9-12.	+12	+34½

Boiler Tubes: Net base c.l. prices, dollars per 100', mill; minimum wall thickness, cut lengths 4 to 24"; inclusive.

O.D. In.	B.W. Ga.	Seamless Hot Rolled	Seamless Cold Drawn	Elec. Weld Hot Rolled	Elec. Weld Cold Drawn
1	13	....	13.39	13.00	13.00
1¼	13	....	15.87	13.21	15.39
1½	13	$15.05	17.71	14.60	17.18
1¾	13	17.11	20.15	16.60	19.54
2	13	19.18	22.56	18.60	21.89
2¼	13	21.37	25.16	20.73	24.40
2½	12	23.54	27.70	22.83	26.88
2½	12	25.79	30.33	25.02	29.41
2¾	12	27.33	32.14	26.51	31.18
3	12	28.68	33.76	27.82	32.74
3¼	11	33.39	39.29	32.39	38.11
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78
4½	9	58.99	69.42	....	....
5	9	68.28	80.35	....	....
6	7	104.82	123.33	....	....

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb. mill.

Light (billet): $3.55-$4.25 per 100 lb, mill.

Light (rail steel): $4.70 per 100 lb., Williamsport, Pa.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb., mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill, except: 5.25c, Pittsburgh.

Axles: 5.20c, mill.

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ¾ x 6-in. and shorter	37 off
¾-in. and larger x 6-in. and shorter	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

	A.S. Light	A.S. Reg. and Heavy
Semifinished hexagon	41 off	....
⅞-in. and smaller	.....	38 off
½-in. and smaller	39 off	....
½-in.-1-in.	.....	37 off
⅝-in.-1-in.	37 off	35 off
1⅛-in.-1½-in.	34 off	28 off
1⅝-in. and larger		

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	46 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	40 off
¾, ⅞, & 1 x 6 and shorter	35 off

Square Head Set Screws

Upset 1-in. and smaller	51 off
Headless, ¼-in. and larger	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger	6.75c
⅞-in. and under	48 off

Washers, Wrought

Fob shipping point, to jobbers ...Net to $1 off

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.5c
18	4	3	...	...	114.5c
18	4	2	...	9	168.5c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.39	50.89	51.39	51.89
Brooklyn, N. Y., del.	....	52.40	52.90	....
Philadelphia, del.	50.17	50.67	51.17	51.67
Birmingham, furnace	42.88	43.38	....	....
Cincinnati, del.	....	49.09	....	....
Buffalo, furnace	*47.00	*47.00	*47.50	48.00
Boston, del.	55.42	55.42	55.92	....
Rochester, del.	49.22	49.22	49.72	50.22
Syracuse, del.	50.025	50.025	50.525	41.025
§**Chicago,** district furnaces	46.00	46.00-46.50	46.50	47.00
Milwaukee, del.	47.72	47.72-48.22	48.22	48.72
Muskegon, Mich., del.	....	50.98-51.48	51.48	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.17	48.67	48.67	49.17
Lone Star, Tex., furnace	....	†75.00	....	....
Duluth, furnace	....	46.00	46.50	47.00
Erie, Pa., furnace	45.50	46.00	46.50	47.00
Everett, Mass., furnace	....	48.75	49.25	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	53.63	....	....
Portland, Oreg., del.	....	53.63	....	....
Los Angeles, San Francisco.	53.13	53.63	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65	49.15	49.65	....
Ironton, Utah, furnace	....	46.50	....	....
‡**Neville Island, Pa.,** furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	....	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	50.00	50.50	51.00	....
Toledo, O., furnace	45.50	46.00	46.50	47.00
Cincinnati, del.	50.05	50.55	....	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	49.87	50.37	50.37	50.87

* Republic Steel Corp. quotes $1 a ton higher for basic, No. 2 foundry and malleable at Buffalo.

† Low phosphorus southern grade.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.

§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)	$59.50		
6.51-7.00	60.75	9.01- 9.50	67.00
7.01-7.50	62.00	9.51-10.00	68.25
7.51-8.00	63.25	10.01-10.50	69.50
8.01-8.50	64.50	10.51-11.00	70.75
8.51-9.00	65.75	11.01-11.50	72.00

F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $81.75 furnace, Niagara Falls; $84 open-hearth anu $85 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn. ..$62 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., $54; Buffalo, Troy, N. Y., $50. Philadelphia, $56.81 delivered.

Intermediate phosphorus, Central furnace, Cleveland, $51.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more $37; less than 60% $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$13.50-15.50
Connellsville, foundry	16.00-18.00
New River, foundry	16.50
Wise county, foundry	15.35
Wise county, furnace	14.60

Oven Foundry Coke

Kearney, N. J., ovens	$21.50
Chicago, ovens	20.40
Terre Haute, ovens	21.00
Milwaukee, ovens	21.15
New England, del.	22.75
Birmingham, del.	18.66
Indianapolis, ovens	20.85
Cincinnati, del.	21.40
Ironton, O., ovens	18.25
Erie, Pa., del.	22.45
Painesville, O., ovens	20.90
Cleveland, del.	22.45
Buffalo, del.	22.75-23.10
Detroit, del.	21.65
Philadelphia, ovens	20.55
Swedeland, Pa., ovens	20.50
Portsmouth, O., ovens	19.25

Coal Chemicals

Spot, cents per gallon, ovens

(Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	20.50-26.50
Toluol, two degrees	23.00-26.50
Industrial xylol	20.50-26.50

Per pound, ovens

Phenol, 40 (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00
Naphthalene flakes, balls, bbl to jobbers, "household use"	12.00

Per ton, bulk, ovens

Sulphate of ammonia	$45.00

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, or Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa.; Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa. $85; Joliet or Rockdale, Ill., $89, Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Sliding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68%	14.50
Brazil iron ore, 68-69%	18.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26–$28

Manganese Ore

48-50%, duty paid, f.o.b. cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Standard Structural Shapes	Carbon ⅜"-¾"	Floor ¾" & Thicker
Boston (city) ..	5.84	6.64	7.84	6.04	6.90	5.69	6.39	8.24-9.74	5.54	5.89	7.34
Boston (c'try) .	5.69	6.49	7.69	5.89	6.75	5.54	6.24	8.09-9.59	5.39	5.74	7.19
New York (city)	5.73-5.80	6.73	7.74-7.83	6.08-6.28	...	5.83	6.58	8.22	5.52-5.78	5.98	7.48
New York(c'try)	5.53-5.60	6.53	7.54-7.63	5.88-6.08	...	5.63	6.38	...	5.32-5.58	5.78	7.28
Phila. (c'try) ..	5.50-5.86	6.61-6.81	7.42-7.62	5.46-5.81	...	5.57-5.65	6.31	7.94	5.24-5.40	5.52-5.65	6.73-7.16
Phila. (city)...	5.35-5.71	6.46-6.66	7.27-7.47	5.31-5.66	...	5.42-5.50	6.16	7.79	5.09-5.25	5.37-5.50	6.58-7.01
Balt. (city) ...	5.43†	6.33	7.13	5.49	...	5.54	...	...	5.48	5.68	7.13
Balt. (c'try)...	5.28†	6.18	6.98	5.34	...	5.39	...	...	5.33	5.53	6.98
Norfolk, Va. ..	5.75	...	...	...	...	6.00	7.00	...	6.00	6.00	7.50
Wash. (w'house)	5.81-5.97	...	...	5.87	...	5.88-5.92	6.58	...	5.82-5.86	6.02-6.06	7.47-7.51
Buffalo (del.)..	5.20-5.25	5.95-6.00	7.75	5.70	6.50	5.35	6.05	9.50	5.25	5.60	7.70
Buff. (w'house)	5.05-5.10	5.80-5.85	7.60	5.55	6.35	5.20	5.90	9.40	5.10	5.45	7.55
Pitts. (w'house)	4.85-5.00§	5.75-5.85[8]	7.00-7.05	5.00-5.35	5.95-6.00	4.90-5.10	5.65	7.65	4.90-5.15	5.05-5.25	6.55
Det. (w'house).	5.40-5.75§	6.30-6.60	7.60	5.40-5.70	6.50	5.45	6.17	8.12	5.45	5.65-5.80	7.10
Cleveland (del.)	5.13-5.29	6.00-6.29	7.34-7.49	5.17-5.69	6.85	5.30-5.34	6.05-6.10	7.94-8.29	5.34-5.60	5.50-5.54	6.95-6.99
Cleve. (w'hse) .	4.98-5.75	5.75-6.14	7.19-7.85	5.02-5.54	6.70	5.15-5.19	5.90-5.95	7.79-8.14	5.19-5.45	5.35-5.39	6.80-6.84
Cincin. (w'hse).	5.26	6.11	7.60	5.52	6.07	5.52	6.07	...	5.37	5.61	6.91
Chicago (city)..	5.20	5.90‡[8]	7.20	5.00	6.30	5.05	5.85	7.80[9]	5.05	5.25	6.70
Chicago (w'hse)	5.05	5.75‡[8]	7.05	4.85	6.15	4.90	5.70	7.65[9]	4.90	5.10	6.55
Milwaukee (city)	5.37	6.07‡[8]	7.37	5.17	6.47	5.22	6.02	7.97[9]	5.22	5.42	6.87
St. Louis (del.)	5.34§	6.24[8]	7.44	5.34	6.64	5.39	6.19[12]	6.64	5.39	5.59	7.04
St. L. (w'hse).	5.19§	6.09[8]	7.29	5.19	6.49	5.24	6.04[12]	9.49	5.24	5.44	6.89
Birm'ham (city)	5.20§	...	6.60	5.20	...	5.15	6.66	...	5.15	5.40	7.41-7.66
Birm'ham(c'try)	5.05§	...	6.45	5.05	...	5.00	6.51	...	5.00	5.25	7.26-7.51
Omaha, Nebr...	6.07	...	9.33	6.07	...	6.12	6.92	...	6.12	6.32	7.77
Los Ang. (city)	6.55§	8.05	8.20†	6.75	9.50	6.20	8.00-8.50	...	6.70	6.40	8.15
Los Angeles (w'house) ...	6.40§	7.90	8.05†	6.60	9.35	6.05	7.85-8.35	...	6.55	6.25	8.00
San Francisco..	5.95[21]	7.15	8.05	6.75[21]	8.25[18]	5.90[21]	7.55	10.20‡‡	5.90	7.60	8.10
Seattle-Tacoma .	6.35[17]	7.90[5]	8.40	6.70[17]	...	6.20[17]	8.15[1]	9.45[2]	6.30[17]	6.35[17]	8.40[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [18]—2000 lb and over; [17]—300 to 999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb; [23]—Price (but not other price in range) applies to any and all quantities.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $57, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn.) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $160 per gross ton of alloy, c.l., packed, $172; gross ton lots, packed, $187; less gross ton lots, packed, $204; f.o.b. Alloy, W. Va., Niagara Falls, N. Y. ;or Welland, Ont. Base price; $165, Rockwood, Tenn.; $162, f.o.b. Birmingham and Johnstown, Pa., furnaces; $160, Sheridan, Pa.; $163, Aetna, Pa. Shipment from Pacific Coast warehouses on one seller add $31 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Ore. Shipment from Chicago warehouse, ton lots, $201; less gross ton lots, $218 fob Chicago. Add or subtract $2 for each 1%, or fraction thereof, of contained manganese over 82% and under 78%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 26.0c, ton lot 27.1c, less ton 28.3c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload, 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.6c per lb of alloy, carload packed, 9.35c, ton lot 10.25c, less ton 11.25c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 20.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb. of contained Cr, c.l., packed 22.9c, ton lot 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.05% C 29.25c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50-17.50c per lb of contained Si; packed 18.90c; ton lots 20.00c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 10.5c per lb of contained Si, carload packed 12.1c, ton lot 13.55c, less ton 15.2c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.0c per lb of contained Si, carload packed 14.3c, ton lot 15.45c, less ton 16.7c. Delivered. Spot, add 0.3c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Mn, 97% Si and 1% max. Fe.). C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. D., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c, smaller lots 8.65c; or, lump, carload, bulk, 8.40c per lb of alloy, packed c.l. 9.20c, ton lots 9.30c, 200 to 1000 lb 9.65c, less 200 lb 10.15c per lb of alloy. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3⅝ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

(*Please turn to Page 164*)

ERP Countries Get Metal Quotas

ECA issues procurement authorizations for 327,607 tons of nonferrous metals and products and 30,729 tons of ores and concentrates in period from Apr. 3 to Sept. 30

New York — Economic Co-operation Administration issued a report last week showing procurement authorizations of nonferrous metals to countries participating in the European Recovery Program, covering the period from Apr. 3 to Sept. 30, 1948. Nonferrous metal and products, totaling 327,607 long tons, were authorized to be procured from the following, with figures in long tons:

Canada, 179,844; United States, 66,225; Chile, 53,430; Mexico, 7995; Belgium, 6560; Peru, 5708; Italy, 3493; Belgian Congo, 2559; Norway, 738; United Kingdom, 592; Netherlands, 276; Bizone, 98; and Netherlands East Indies, 89.

Of the total, aluminum and aluminum base alloys accounted for 88,937 tons, bulk of which was from Canada to the United Kingdom; copper, 121,593, bulk of which was from Chile, Canada and the United States to the United Kingdom, France and Italy; brass and bronze, 5023 tons, bulk of which was from the United States to France; lead and lead-base alloys, 40,222 tons, bulk of which was from Canada to the United Kingdom; nickel and nickel-base alloys, 2111 tons, which was from Norway, Canada, United Kingdom and the United States to France, Bizone and French Zone; tin and tin-base alloys, 927 tons, bulk of which was from Belgium and the Netherlands to Bizone, Austria and French Zone; precious metals and miscellaneous nonferrous metals and alloys, 713 tons.

Procurement authorizations of nonferrous metallic ores and concentrates for the Apr. 3 to Sept. 30, 1948, period totaled 30,729 long tons actual weight (not metallic content). Of this total, France is to receive 24,164 tons, French Zone, 8866 tons; Netherlands, 1279 tons; and Bizone, 4400 tons. Lead ore and concentrates, 886 tons, will be procured from Canada; zinc ore and concentrates, 13,384 tons from Peru and 9941 tons from Newfoundland; molybdenum, 1279 tons from the United States; manganese, 2200 tons each from Brazil and India; tungsten, 423 tons from Peru, 190 tons from the United States and 98 tons from Bolivia; zirconium, 128 tons from Brazil.

Copper — Supplies of copper likely will be tighter for delivery during at least the last two months of this year as a result of the strike which halted operations last week at Kennecott Copper Corp.'s properties in Utah. The shutdown was precipitated by a walkout of members of the Brotherhood of Locomotive Firemen and Enginemen at the company's properties in Utah. The company continued to book business last week at unchanged prices for November delivery, but made proportionate reductions in consumers' orders.

Consumption of copper increased 11,450 tons in September to a total of 126,486 tons, according to the Copper Institute. Unfilled orders on the books of fabricators declined 16,753 tons to a total of 329,811 tons as of Sept. 30. Fabricators' refined stocks eased to 394,917 tons from 398,211, while total stocks and purchases increased to 235,368 tons from 221,165 tons at the end of August. Therefore, there was a deficit of 94,443 tons in stocks available for sale, the smallest total recorded since the end of April.

Brass Products — According to the Bridgeport Brass Co., it is that company's understanding that "the government intends to acquire, between now and the end of June, 90,000 tons of copper in addition to the 30,000 tons they have purchased already but which, as yet, has not been delivered. This means that from the monthly production of available supply the government will require 15,000 tons. Such a great reduction will obviously put a burden on our ability, as well as all other brass mills, to keep everyone supplied at the current level."

Lead — Production of primary lead increased to 34,037 tons in September from 27,923 tons in August, reflecting the termination of the strike at the southeast Missouri properties of St. Joseph Lead Co. Production from secondary sources totaled 3068 tons, an increase of about 1430 tons. In the first nine months, total output of refined lead amounted to 399,138 tons compared with 432,650 tons in the like 1947 period. Production of antimonial lead amounted to 9657 tons in September compared with 7920 tons in August, making the nine-months total 83,327 tons.

Shipments to domestic consumers increased about 1630 tons to 35,067 tons. Stocks at refineries at the end of September totaled 21,003 tons compared with 18,971 tons at the end of August.

Zinc—All leading zinc smelters are now booking business on the basis of 15.50c, East St. Louis, for prime western. Demand for metal at the higher level was described as even heavier than before the advance.

Tin — ECA has allocated $3 million for rehabilitation of tin, tungsten and antimony mines in China as a part of a provisional allotment of $37,750,000. A $1 milion allotment was announced for the same purposes in south central and southwest China. The reconstruction projects include an additional $2 million for tin and antimony mines in Hunan and Yunan provinces of southwest and south central China.

According to a Singapore dispatch, Malaya's tin industry made good progress in the past few months despite communist efforts to hamper operations. Exports of tin for the third quarter of this year were the highest since the liberation. Total exports during the first nine months were valued at more than 135 million Straits dollars (about $67,500,000 U. S.) compared with 94 million Straits dollars for the entire 1947 year.

Aluminum — Members of the Nonferrous Founders' Society have accepted a proposal for co-operative acquisition of one of the two remaining aluminum reduction plants for sale by the United States government. These plants are located at Massena, N. Y., and Riverbank, Calif.

Aluminum Demand Tops Output

New York — Production of primary aluminum is maintaining a peacetime record rate and has been exceeded in only two wartime years. Total for the first nine months came to about 500,000 net tons compared with 571,750 tons for the twelve months in 1947, 920,176 tons in 1943 and 775,446 tons in 1944. September production was 53,254 tons compared with 54,953 tons in August, according to Donald M. White, secretary, Aluminum Association.

Current production is averaging about 1700 tons a day, but the "industry cannot produce enough, even though the output is now more than four times what it was before the war," Mr. White said. "In fact, the year's demand is running about half a billion pounds ahead of production."

Shipments of aluminum sheet, plate and strip by member companies of the Aluminum Association, which account for about 97 per cent of the United States total, aggregated 476,221 tons during the first three quarters of 1948. During September shipments amounted to 51,580 tons, Mr. White said.

S. A. Mining Operations Rise

New York—Intensified development of mining operations in South America's principal metal-producing countries not only is increasing their output but is serving as a "shot in the arm" to their national economies, it was declared by Sherwin F. Kelly, mining expert, on his return here from Lima, Peru, after completing a four-month survey trip of the Good Neighbor countries.

Mr. Kelly, who was in frequent consultation during his trip with leading mine operators in Bolivia, Peru, Chile and Argentina, said that the development of mining properties in these countries might soon lift them from "have-not" to "have" nations in the world market, step up employment at home, and put them on a more stable economic footing.

"I found these countries anxious to apply newest prospecting methods at their mines in an effort to penetrate additional ore deposits at depths heretofore untapped," said Mr. Kelly.

"Bolivia," he explained, "today produces approximately 50 per cent of the world tin output, and is providing us with more than 75 per cent of our tin imports which are running at about 35,000 tons per year. Until the Malay States and Netherland East Indies, which produced 55 per cent of world tin output before they were overrun by the Japs, can regain their prewar position, we must continue to look to Bolivia as our main source of tin supply."

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 23.50c, Conn. Valley; Lake, 23.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 21.25-22.00c; 88-10-2 (No. 215) 31.00c; 80-10-10 (No. 305) 27.25c; No. 1 yellow (No. 405) 17.50c.

Zinc: Prime western 15.50c, brass special 15.75c, intermediate 16.00c, East St. Louis; high grade 16.50c, delivered.

Lead: Common 19.30-19.35c, chemical and corroding 19.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type 24.25-25.00c; No. 12 foundry alloy (No. 2 grade) 24.00-24.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.50-26.25c; grade 2, 24.50-25.25c; grade 3, 24.00-24.50c; grade 4, 23.00-23.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; shot nom.; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $76-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.90, del.; special or patented shapes, $2.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 77.50c per ounce.

Platinum: $93-$96 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$115 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, fob mill)

Sheet: Copper 37.18; yellow brass 33.75; commercial bronze, 95%, 37.11; 90%, 36.63; red brass, 85%, 35.64; 80%, 35.16; best quality, 34.63; nickel silver, 18%, 46.41; phosphor-bronze, grade A, 5%, 56.05.

Rods: Copper, hot rolled 33.03; cold drawn 34.28; yellow brass, free cutting, 33.44; commercial bronze, 95% 36.80; 90% 36.32; red brass, 85% 35.33; 80% 34.85.

Seamless Tubing: Copper 37.22; yellow brass 36.76; commercial bronze 90% 39.29; red brass 85% 38.55; 80% 38.07.

Wire: Yellow brass 34.04; commercial bronze, 95% 37.40; 90% 36.92; red brass, 85% 35.93, 80% 35.45; best quality brass 34.92.

Copper Wire: Bare, soft, fob eastern mills, c.l. 29.42½c, l.c.l. 29.92½-30.05c; weatherproof, fob eastern mills, c.l. 29.60-29.85c, l.c.l. 30.35c; magnet, delivered, c.l. 32.75-33.50c, 15,000 lb or more 33.00-33.75c, l.c.l. 33.50-34.25c.

ALUMINUM

Sheets and Circles: 2S and 3S mill finish c.l. (Two producers quote 1-cent per pound lower.)

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12-24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	—Hexagonal— R317-T4	—Hexagonal— 17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531 *	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $23.25 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. **Pipe:** Full coils, $22.50 per cwt; cut coils, $22.75. **Traps and Bends:** List price plus 70%.

ZINC

Sheets, 19.50-20.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 18.25c-19.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 17.25c; over 12-in., 18.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 60.00c. **Strip,** cold-rolled 66.00c. **Rods and shapes,** 56.00c. **Plates** 58.00c. **Seamless tubes,** 89.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 47.00c; **Strip,** cold-rolled, 50.00c. **Rods and shapes,** 45.00c. **Plates,** 46.00c. **Seamless tubes,** 80.00c. **Shot and blocks,** 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb., 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 33.84c; oval 33.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 46.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 26.50c; 275-lb. or 500-lb bbl, 24.50c, fob Cleveland, freight allowed on barrels, or 3 or more kegs.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 39.25c, fob Cleveland; 39.00c, Detroit; 38.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, Wis.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 23.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.125	21.125	20.375
Yellow brass	18.000	17.750	17.125
Commercial Bronze			
95%	20.125	19.875	19.375
90%	19.750	19.500	19.000
Red brass			
85%	19.750	19.500	19.000
80%	19.500	19.250	18.750
Best Quality (71-79%)	19.000	18.750	18.250
Muntz Metal	17.250	17.000	16.500
Nickel, silver, 10%	19.625	19.375	9.813
Phos. bronze, A.	22.625	22.375	21.375
Naval brass	17,750	17.500	17.000
Manganese bronze	17.750	17.500	16.875

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 19.50-19.75, No. 2 copper 18.50-18.75, light copper 17.50-17.75, composition red brass 17.00, auto radiators 13.75, heavy yellow brass 12.50, brass pipe, 13.00-13.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 20.25-20.50, No. 2 copper 19.25-19.50, light copper 18.25-18.50, refinery brass (60% copper), per dry copper content 18.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.50-18.00, No. 2 16.50-17.00, light copper 15.50-16.00, No. 1 composition red brass 14.00-14.50, No. 1 composition turnings 13.50-14.00, mixed brass turnings 8.25-8.50, new brass clippings 13.00-14.00, No. 1 brass rod turnings 10.50-11.00, light brass 7.50-8.00, heavy yellow brass 10.25-10.50 new brass rod ends 11.00-11.50, auto radiators, unsweated 12.00-12.25, cocks and faucets 11.25-11.75, brass pipe 11.50-11.75.

Lead: Heavy 18.00-18.50, battery plates 12.00-12.25, linotype and stereotype 18.00-18.50, electrotype 16.50-17.00, mixed babbitt 15.75-16.25, solder joints, 19.75-20.25.

Zinc: Old zinc 7.75-8.25, new die cast scrap 7.75-8.25, old die cast scrap 5.00-5.50.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 13.00-13.50, old sheets 10.00-10.50, crankcase 10.00-10.50, borings and turnings 5.50-6.00, pistons, free of struts, 10.00-10.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Sept. Avg.	23.50	19.325	15.00	103.00	16.50	35.00	40.00	75.284
Oct. 1	23.50	19.30–19.35	15.00	103.00	16.00–17.00	35.00	40.00	76.50
Oct. 4	23.50	19.30–19.35	15.00	103.00	16.00–17.00	35.00	40.00	77.00
Oct. 5	23.50	19.30–19.35	15.00	103.00	16.00–17.00	35.00	40.00	77.25
Oct. 6-9	23.50	19.30–19.35	15.00	103.00	16.00–17.00	35.00	40.00	77.50
Oct. 11-18	23.50	19.30–19.35	15.00	103.00	17.00	38.50	40.00	77.50
Oct. 19-22	23.50	19.30–19.35	15.00–15.50	103.00	17.00	38.50	40.00	77.50
Oct. 23-28	23.50	19.30–19.35	15.50	103.00	17.00	38.50	40.00	77.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00*
No. 1 Busheling	42.50-43.00*
Nos. 1, 2 Bundles	42.50-43.00
No. 3 Bundles	40.50-41.00
Machine Shop Turnings	37.50-38.00
Mixed Borings, Turnings	37.50-38.00
Short Shovel Turnings	39.50-40.00
Cast Iron Borings	39.50-40.00
Bar Crops and Plate	49.00-50.00
Low Phos. Steel	49.50-50.00
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	65.00-66.00
Machinery Cast	72.00-73.00
Charging Box Cast	61.00-62.00
Heavy Breakable Cast	60.00-61.00
Malleable	74.00-75.00
Brake Shoe	57.50-58.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.50-44.00
R.R. Malleable	75.00-80.00
Axles	55.25-56.25
Rails, Rerolling	59.00-60.00
Rails, Random Lengths	55.00-57.00
Rails, 3 ft and under	62.00-63.00
Rails, 18 in. and under	63.00-64.00
Railroad Specialties	60.25-61.25
Uncut Tires	54.50-55.00
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$42.00-42.50*
No. 2 Heavy Melt. Steel	42.00-42.50*
No. 1 Busheling	42.00-42.50*
Nos. 1 & 2 Bundles	42.00-42.50*
Machine Shop Turnings	37.00-37.50
Mixed Borings, Turnings	36.50-38.50
Short Shovel Turnings	38.00-38.50
Cast Iron Borings	38.00-38.50
Bar Crops and Plate	47.00-47.50
Punchings & Plate Scrap	47.00-47.50
Heavy Turnings	42.00-43.00
Alloy Free Turnings	40.00-41.00
Cut Structurals	48.50-51.50

Cast Iron Grades

No. 1 Cupola	75.00-77.00
Charging Box Cast	64.00-66.00
Stove Plate	65.00-67.00
Heavy Breakable Cast	55.00-60.00
Unstripped Motor Blocks	62.00-64.00
Malleable	79.00-81.00
Brake Shoes	53.00-55.00
Clean Auto Cast	75.00-77.00
No. 1 Wheels	64.00-66.00
Burnt Cast	57.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*
R.R. Malleable	80.00-82.00
Rails, Rerolling	60.00-66.00
Rails, Random Lengths	60.00-63.00
Rails, 3 ft and under	63.00-66.00
Cast Steel	57.00-59.00
Railroad Specialties	60.00-62.00
Uncut Tires	58.00-59.00
Angles, Splice Bars	61.00-64.00

* Plus applicable freight springboard on earmarked material.

VALLEY

No. 1 Heavy Melt. Steel	$42.50-43.00*
No. 2 Heavy Melt. Steel	42.50-43.00
No. 1 Bundles	42.50-43.00
Machine Shop Turnings	37.00-39.00
Short Shovel Turnings	39.00-39.50
Cast Iron Borings	38.50-39.00
Low Phos.	48.50-50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00-44.00*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$37.50-38.00
Short Shovel Turnings	39.50-40.00

CINCINNATI

No. 1 Heavy Melt. Steel	$42.00
No. 2 Heavy Melt. Steel	42.00
No. 1 Busheling	42.00
Nos. 1 & 2 Bundles	42.00
Machine Shop Turnings	36.00
Mixed Borings, Turnings	36.00
Short Shovel Turnings	38.00
Cast Iron Borings	37.00

Cast Iron Grades

No. 1 Cupola Cast	63.00
Charging Box Cast	53.00
Heavy Breakable Cast	59.00
Stove Plate	55.00
Unstripped Motor Blocks	56.00
Brake Shoes	50.00
Clean Auto Cast	63.00
Drop Broken Cast	71.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	43.00
R.R. Malleable	75.00
Rails, Rerolling	62.00
Rails, Random Lengths	58.00
Rails, 18 in. and under	63.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-65.00
Heavy Breakable Cast	54.00-59.00
Clean Auto Cast	60.00-65.00

BUFFALO

No. 1 Heavy Melt. Steel	$48.00-49.00
No. 2 Heavy Melt. Steel	41.75-42.25
No. 1 Busheling	41.75-42.25
No. 1 & 2 Bundles	41.75-42.25
Machine Shop Turnings	36.75-37.25
Mixed Borings, Turnings	36.75-37.25
Cast Iron Borings	37.75-38.25
Short Shovel Turnings	38.75-39.25
Low Phos.	49.00-51.00

Cast Iron Grades

Mixed Cupola	65.50-66.50
No. 1 Cupola	68.00-69.00
Heavy Breakable Cast	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under	61.00-62.00
Railroad Specialties	60.00-61.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$45.00-45.50
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	37.50
Mixed Borings, Turnings	37.50
Short Shovel Turnings	38.50
Bar Crop and Plate	50.00-51.00
Punchings & Plate Scrap	50.00-51.00
Cut Structurals	50.00-51.00
Elec. Furnace Bundles	47.00-48.00
Heavy Turnings	45.50-46.50
No. 1 Chemical Borings	46.00-46.50

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast	67.00-68.00
Charging Box Cast	64.00-65.00
Heavy Breakable Cast	62.00-62.50
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	69.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$39.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings	30.00-31.50
Punchings & Plate Scrap	42.00-42.50
Cut Structurals	42.00-42.50
Elec. Furnace Bundles	42.00-42.50

Cast Iron Grades

No. 1 Cupola Cast	57.00-58.00
Charging Box Cast	57.00-58.00
Heavy Breakable	58.00
Unstripped Motor Blocks	53.50-54.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$38.90
No. 2 Heavy Melt. Steel	34.40
No. 1 Bundles	34.40
No. 1 Busheling	34.40
Machine Shop Turnings	29.90
Mixed Borings, Turnings	29.90
Short Shovel Turnings	31.90
Bar Crops and Plate	40.00-41.00
Punchings & Plate Scrap	40.00-41.00
Chemical Borings	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast	60.00-65.00
Heavy Breakable Cast	55.00-58.00
Stove Plate	54.00-55.00
Unstripped Motor Blocks	50.00-52.00
Clean Auto Cast	54.00-56.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings	38.50-39.00
Cast Iron Borings	37.50-38.00
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	70.00-71.00
Clean Auto Cast	70.00-71.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	45.00-46.00
Malleable	81.00-82.00
Rails, Rerolling	66.00-67.00
Rails, Random Lengths	57.00-58.00
Rails, 3 ft and under	60.00-61.00
Rails, 18 in. and under	62.00-63.00
Railroad Specialties	55.50-56.50
Angles, Splice Bars	56.50-57.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$44.00-45.00
No. 2 Heavy Melt. Steel	40.00-41.00
Machine Shop Turnings	35.00-36.00
Short Shovel Turnings	36.50-37.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-66.00
Mixed Cast	56.00-58.00
Heavy Breakable Cast	59.00-60.00
Brake Shoes	60.00-61.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R. R. Malleable	71.00-72.00
Rails, Rerolling	63.00-65.00
Rails, Random Lengths	56.00-59.00
Rails, 3 ft and under	60.00-61.00
Uncut Tires	51.00-52.00
Angles, Splice Bars	54.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Long Turnings	24.50
Short Shovel Turnings	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*27.50
No. 2 Heavy Melt Steel	*27.50
No. 1 Busheling	*27.50
Nos. 1 & 2 Bundles	*27.50
No. 3 Bundles	*24.50
Machine Shop Turnings	*18.00
Bar Crops and Plate	*27.50
Cast Steel	*27.50
Alloy Free Turnings	*18.00
Cut Structurals	*27.50

Cast Iron Grades

No. 1 Cupola Cast	50.00-65.00

Railroad Scrap

No. 1 Heavy Melting	*28.50
Axles	*34.00
Rails, Random Lengths	*29.00

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
No. 1 Busheling	27.50
Nos. 1 & 2 Bundles	27.50
No. 3 Bundles	24.50
Machine Shop Turnings	21.00-22.50
Mixed Borings, Turnings	21.00-22.50
Punchings & Plate Scrap	35.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	50.00
Heavy Breakable Cast	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	37.50-40.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	28.50
Railroad Malleable	30.00
Rails, Random Lengths	30.00-32.00
Angles and Splice Bars	28.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$27.50
No. 2 Heavy Melt. Steel	27.50
Nos. 1 & 2 Bundles	27.50
Machine Shop Turnings	20.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles	28.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-65.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$23.00
No. 1 Bundles	23.00
Mechanical Bundles	21.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	23.00
Rails, Rerolling	26.00
Bushelings	17.50
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	48.00-50.00
No. 2 Cast	44.00-45.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

Sheets, Strip . . .

Galvanizing extras based on 15.50-cent zinc to be issued by steel producers soon

Sheet Prices, Page 140

Pittsburgh — Galvanized sheet producers are holding up billings pending extension of coating extra table on both galvanized and culvert sheets. This table represents the average cost of a specific amount of zinc to cover a given area and applicable coating extras were broken down for specific gage ranges based on 5-cent zinc price, f.o.b. St. Louis. The table, however, only included extras up to a maximum of 15-cent per pound zinc. With the 1/2-cent increase in zinc Oct. 22, steel producers are forced to extend this extras table.

Hot-rolled sheet and strip producers have not yet adopted higher extras on gage, width, length, pickling, and annealing initiated by Great Lakes Steel Corp. and Weirton Steel Co., Oct. 1. This entire matter is under consideration, with some such action indicated by other interests in the near future. Similarly most producers have not officially classified cold-rolled strip under 24 inches as cold-rolled strip, in line with such action taken by Jones & Laughlin Steel Corp. sometime ago. However, integrated interests are discouraging acceptance of cold-rolled sheet orders under 24 inches, urging customers to specify cold-rolled strip instead. The industry generally has not followed dual pricing adopted by Sharon Steel Co. on hot-rolled sheets and strip 6 inches and narrower, and over 6 inches.

Effective Oct. 23, Carnegie-Illinois Steel Corp. extended the coating extra tables on flat galvanized sheets, culvert sheets and roofing. The coating extra table for heavier than regular commercial coatings for galvanized flat sheets has been augmented to read as: When zinc is 14 cents per pound, add 200 per cent to extra for coating stipulated; when 16 cents, add 220 per cent. Additions to the coating extra table on galvanized flat sheets and formed roofing and siding are presented below:

Coating Extras*
Galvanized Flat Sheets
(cents per 100 lbs)

Gage			
9-14	15-23	24-27	28-32
0.28	0.55	0.83	1.15

Formed Roofing and Siding
(Extras per Square)

Gage							
29	28	26	24	22	20	18	16
0.87	0.87	0.87	0.87	0.99	1.10	1.10	1.58

* Based on zinc price over 15.00c to 16.00c per lb.

Revision in Carnegie's coating extras for all galvanized sheet products averaged about $1.25 a ton, or approximately 1 per cent.

Reported decision of General Motors Corp. to construct two plants in the Pittsburgh area is seen as another factor in tightening of overall sheet and strip supply by some metalworking companies. General Motors' proposed plant at Ambridge is said to be the first exclusive "blanking" plant of the company.

New York — Sellers of sheets and strip are expected to open their books

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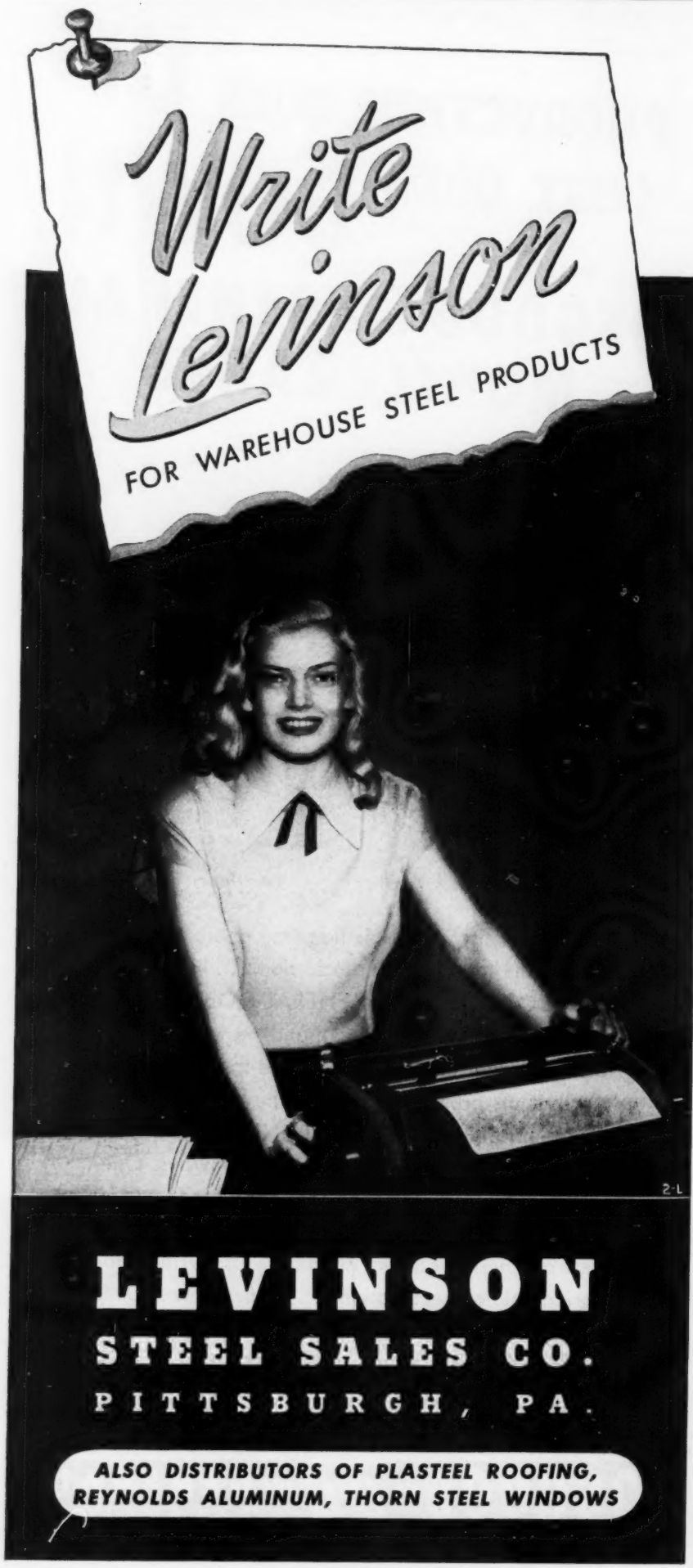

within the next fortnight for first quarter. As a matter of fact, one large producer already has set up quotas for January, this interest acting on a month-to-month basis. Indications at present are that quotas of "free" tonnage will be even lighter than in the current quarter, which, in turn, is lighter than in the preceding three-month period.

Philadelphia — In view of the recent one-half cent increase in zinc prices, galvanized sheet and other zinc-coated steel products are due for a general increase. The leading sheet producer, in fact, has already announced an average increase of approximately $1.25 a ton, or about 1 per cent in the price of such products. The confused situation in stainless steel, especially with regard to jobber discounts, is still under review by some of the leading sellers. Some trade observers believe that the time is not too far off when adjustments more favorable to distributors will be made.

Cleveland—Pressure to get on order books for flat-rolled carbon products is increasing. This reflects postwar peak levels of industrial activity with an accompanying high consumption of steel and the cutting in on the steel supply by voluntary allocations programs.

Although steel production has been at a high level, production in many cases has failed to come up to expectations or the emergence of voluntary allocations programs has cut tonnage available for the open market. Consequently, some producers have more tonnage booked than they can deliver this year. In an effort to hold orders in line with production one producer expects to take orders for only a small tonnage of hot-rolled strip for December delivery and no orders for cold-rolled or coated strip. There are indications this producer may increase pickling extras on strip.

Stainless sheets in somewhat easier supply, with handmill sheets more readily available than those produced by continuous mills.

As result of the recent rise in price of zinc, an automatic increase of 3c to 12c a hundredweight, depending on gage, was made in prices of hot-dipped galvanized and galvannealed sheets by Republic Steel Corp., Oct. 22.

To overcome a loss position, Republic Steel also raised prices on three grades of handmill silicon sheets $10 a ton, Oct. 26. New prices per hundredweight are: Armature, $5.95; electrical, $6.45; and special motor, $7.20. Prices of silicon coil stock were not changed.

Cincinnati—Production in district sheet mills continues at peak levels, but is apparently making no dent in demand. Pressure for tonnage was never greater, since there has been no easing in requirements on lines heretofore considered seasonal. Mills are holding to schedules and are confident of trimming carryover before opening of next quarter's books. Nothing definite has yet been done on schedules for the first quarter because the supply situation is clouded by indecision on voluntary allocations.

Birmingham — While many processors are reticent to talk for the record or to give specific figures, in-

formation generally is that inventories show most steel stocks lower than they have been in months. Some of them are less than they were a year ago. Particularly is this true of sheets which for years has been one of the district's biggest problems. Emphasis on tin plate, a more profitable product, is partly responsible, mill interests frankly admit.

St. Louis—A perceptible easing of pressure for sheets is noted among producers here the last two weeks. It has not yet been reflected in order cancellations, but complaints over late or non-deliveries have slackened noticeably. The easing is mainly among electrical appliance and fractional motor manufacturers. Total tonnage demand of course remains high. In this district pipeline demand alone would keep capacity filled many months. Pressure for farm sheets, such as roofing, also is unabating. Indications last week were that October's production will be 33,000 tons of finished steel shipped, as against 23,000 tons in September. Ingot production probably will exceed 46,000 tons in October, against 44,297 in September. Finished steel gain is due to improved operations of Granite City Steel Co.'s new cold reduction mill.

Wire . . .

Wire Prices, Page 141

Boston — While there is occasional wavering in pressure for wire products from some sources, there is slight, if any, slackening in overall demand. Mills are filled through the balance of the year with some building up first-quarter schedules. Rods continue in limited supply, but on the whole supply is slightly improved over a year ago. Heading wire in the middle size ranges is difficult to obtain in volume required and screw manufacturers are drawing rods to those sizes when available. Mills are in short supply, reflecting in part withdrawal from this area by one Pittsburgh district mill formerly supplying close to 10 per cent of nail tonnage.

Pittsburgh — Producers of galvanized wire, fencing and nails report no immediate upward price adjustment is being considered to reflect 1/2-cent per pound increase in zinc Oct. 22. Jones & Laughlin Steel Corp. recently issued new price schedule on nails based on column method of pricing. Their former price of $5.20 per 100-pound keg was comparable to Column 103 quoted by leading producers. Output of nails has increased materially in recent months, with some interests reporting less pressure for delivery than was the case this time a year ago. Some companies have been able to increase output through additional installations of nail machines, replacing older units. Low carbon wire supply still is very short, with somewhat easier situation prevailing among specialty items.

Birmingham—The district's largest jobber reports a continuing scarcity of wire products, although the season's first freezing weather has come and gone. An official of the district's biggest producer said, only, that "I can't imagine what becomes of all the wire." Nails, which eased somewhat a short while back, are at a premium again.

HIGH-SPEED STEEL HEAT-TREATING COSTS SLASHED!

Quick Acting JOHNSON

NO. 120 Hi-Speed Furnace

- 1500° F. in 5 minutes
- 2300° F. in 30 minutes

Compact, powerful and remarkably economical in operation. Johnson No. 120 is unexcelled for heat treating high speed steels . . . for hardening any steel tools, dies, or small metal parts. Ideal for brazing carbide tipped tools. Gets the job done FAST to save time and gas. Two burners fire under hearth to assure clean, uniform heat. Easily regulated with accuracy. Firebox 5 x 7¾ x 13½ lined with high temperature insulating refractory. Complete with Carbofrax Hearth, G.E. Motor, and Johnson Blower.

$145.50

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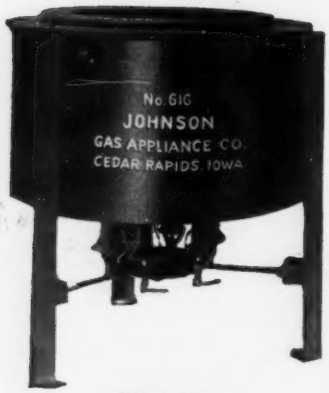

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Melts 600 pounds of lead in 29 minutes

The Johnson No. 616 offers unusual efficiency and remarkable operating economy in melting such soft metals as lead, zinc, tin, babbitt, aluminum, or type metal. This strongly constructed furnace is equipped with six powerful Johnson direct jet burners to cut melting time in half. These burners are the most efficient and economical made and develop highest flame temperature without forced air blast. Each has independent shutoff valve and pilot light. Melting temperatures up to 1500°F. are quickly reached with all six burners. Three burners then hold temperature at operating level to permit substantial fuel savings. Heavy insulating refractory around removable pot retains heat and minimizes operator fatigue. Equipped with 600 pound capacity removable cast iron pot.

$148.00

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Steel Bars . . .

Bar Prices, Page 140

New York — One leading producer of cold-drawn carbon bars has set up quotas for first quarter, eliminating January, in an effort to get caught up on back commitments. These quotas are being set up on various sizes, depending upon the availability of tonnage in the respective categories. Supplies are especially short in small flats, 5/16-inch and under and on rounds 3/16-inch and under. At least one seller is accepting nothing in the way of specifications beyond first quarter, although some other sellers have taken orders on a selective basis for shipment over the entire first half.

A seller of hot and cold-finished alloy bars has opened books for first quarter with all orders being screened to make sure that specifications are in line with past requirements. A particular effort is being made to see that alloy steels are not being used for substitution purposes. Over the past year there has been considerable substituting, because of the stringency in carbon bars. In view of the broadening defense program, with indications that this program will be stepped up considerably after the turn of the year, an effort is being made to conserve alloys for only generally accepted needs.

Virtually all sellers of alloy steels are booked up for the remainder of the year with acceptance of business beyond likely to become general within the next week or so.

Boston — Individual increases in steel prices are marked by upward adjustments in grade differential extras and size extras on small flats covering alloy products by additional mills. Increase in grade extra for 52100 alloy, used extensively by the antifriction bearing industry, is one of the smallest announced by a large supplier, 10 cents per 100 pounds or $2 per ton.

Demand for alloys is forcing producers to screen first-quarter orders carefully. Inquiry for open-hearth tonnage is heavy and extends into first-quarter carryover. Electric furnace schedules are nearly filled and only electric furnace aircraft grades are given the green light. Sellers are checking end use of alloy bars carefully. Cold-drawn carbon bar schedules for first quarter are being assigned with one month lopped off in some cases. Small flats and rounds are especially tight in carbon bars. Distribution of hot-rolled, both carbon and alloys, is restricted to the point where cold finishing mills are concerned as to tonnage to meet commitments.

Pittsburgh — Pittsburgh Crucible Steel Co. has revised its hot-rolled alloy product prices upward in line with adjustments initiated by Carnegie-Illinois Steel Corp., reflecting advance in ferroalloys. Wyckoff Steel Co, this city, and Columbia Steel & Shafting Co., Carnegie, Pa., also revised grade extras on cold-finished alloy bars, in line with those put into effect by hot mills. Continued upward trend in demand is noted for hot-rolled alloy and cold-finished bars, with little variation in requirements between the various product size classifications. Further tightening in supply of alloy bars is indicated

through February of next year at least on basis of increased tonnage requirements under the military voluntary allocation program.

Philadelphia — The principal Pittsburgh producer of hot carbon bars has set up general consumer quotas for January. Action for the remaining two months of the first quarter will depend somewhat upon what happens to the voluntary allotment programs after the end of February, when the law under which they operate is due to expire. A seller of cold-drawn carbon bars has established quotas for the entire period, blanking out January. Apparently certified tonnage is not a sufficient factor to cause delay for the whole quarter, pending settlement of the question as to whether or not public law 395 will be extended.

Cleveland — Increases similar to those instituted recently by Carnegie-Illinois Steel Corp were put into effect Oct. 25 by Republic Steel Corp. on alloy steel, not including stainless.

Increases were made in extras for alloy content of billets and hot-rolled and cold-finished bars, and in size extras on hot-rolled alloy bar flats. The increases for alloy content reflect recent advances in cost of nickel and ferroalloys and range from $5 to $7 a ton, depending on analysis.

In raising extras on bar flats the ranges of sizes has been narrowed, thereby increasing the number of ranges and permitting more precise pricing.

Chicago — Following the pattern set by Carnegie-Illinois ten days earlier, Wisconsin Steel Co. on Oct. 25 increased its alloy bar grade and flat size extras an average of $5 a ton. These increases, which all companies attribute to higher cost of alloying elements, are reportedly meeting with some consumer resistance. More price consciousness is developing among steel buyers, although steel producers feel powerless to prevent further steel price rises if materials costs continue to climb.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 140

Boston—To meet sustained demand for concrete reinforcing bars, allocations this quarter are smaller and some construction work is delayed for want of steel. Distributors are not estimating on some jobs and contractors frequently are forced to shop for even moderate tonnages, filling requirements from several sources.

Seattle—Rolling mills in this area are operating at capacity, every effort being made to expedite delivery of current commitments. New business is not solicited as buyer pressure for materials continues unabated. Producers are refusing undesirable business while trying to accommodate the needs of regular customers. Reinforcing bar order backlogs remain about stationary. Some current contracts will extend into the first half of 1949. Indications are that the present strong demand for mill products, particularly reinforcing bars, will continue for six months or more. Bureau of Reclamation is the largest buyer, being in the market for several thousand tons of bars involved in Columbia basin projects.

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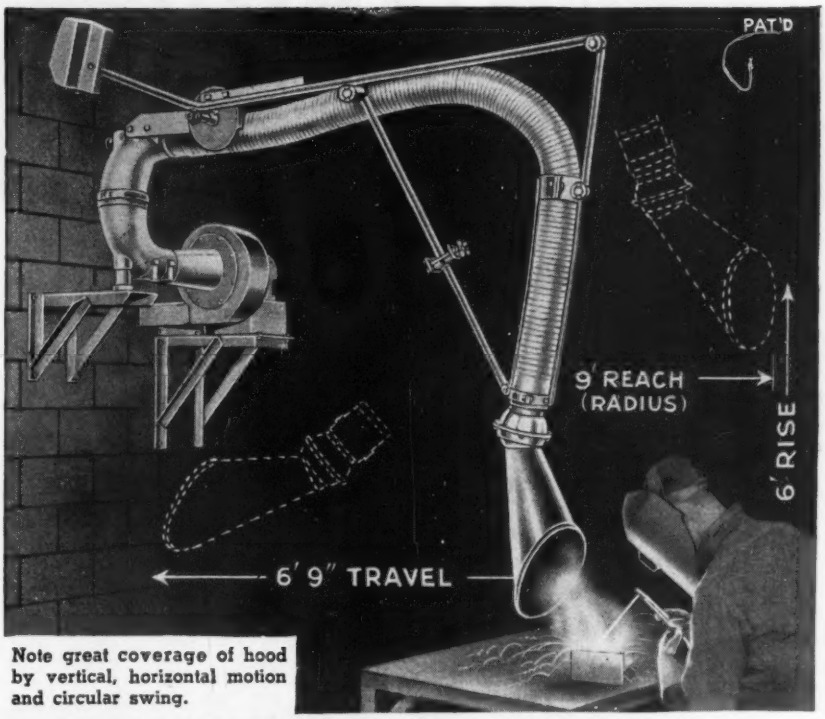

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Tin Plate . . .

Supplies expected to remain tight throughout 1949 despite expanded production facilities

Tin Plate Prices, Page 141

Pittsburgh — Some interests are accepting January specifications for domestic tin plate needs. Sellers report first-quarter export tonnage specifications have been received in moderate volume in recent weeks. Current high level of tin plate output is expected to be sustained through remainder of this year, although there is always the possibility that industrial gas shortage might force intermittent reduction in operating schedules later this quarter. Tin plate supply is expected to remain tight throughout most of 1949, despite scheduled increase in output by mills in the midwest and particularly on West Coast. An additional electrolytic line is scheduled to be installed at Jones & Laughlin's Aliquippa Works. There is no indication that tin coating regulations will be revised, at least for the first half of next year. Some tin plate producers are hopeful that more pig tin will be allotted to this country under the proposal that the government would enter into a long term agreement to purchase all the pig tin not consumed by private industry. Trade authorities claim to have no inkling as to the amount of indicated price advance on tin plate for 1949. This matter normally is not decided until late in the year.

Jones & Laughlin Steel Corp. has filed suit in Federal Court here against National Can Corp. of Delaware for $31,098, which company claims is due on tin mill products sold and delivered to defendant between Aug. 3 and Sept. 3 this year. J. & L. claim its customer paid for shipments between those dates on the old basing point system, which equalized delivered price from nearest producing mill. Amount involved in the suit represents the difference between billing on basis of price at mill and on the old basing point system. Some interests consider this to be a test case on steel mill pricing at point of production. One premise reportedly held by National Can attorneys is that the Federal Trade Commission has never issued a cease and desist order specifically eliminating the basing point system on steel products.

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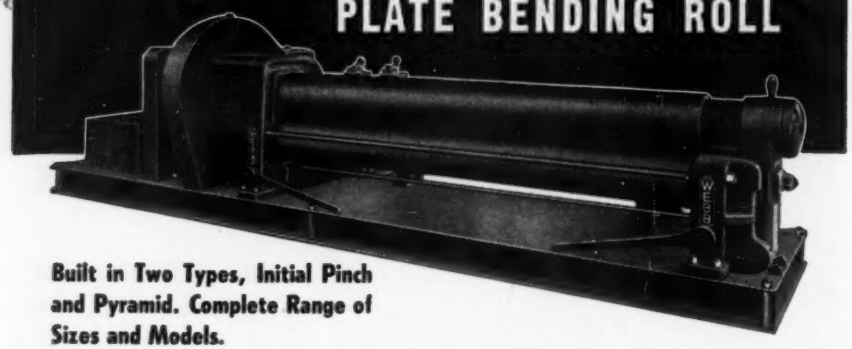

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Tubular Goods . . .

Tubular Goods Prices, Page 141

Pittsburgh — Recent 1/2-cent per pound increase in zinc price has resulted in $1 a ton advance for galvanized pipe by leading interests here. National Tube took this action Oct. 25; Fretz-Moon Tube Co. and Spang-Chalfant Division of National Supply as of Oct. 26. Wheeling Steel Corp. also was expected to take similar action by close of last week. Spang-Chalfant, Wheeling Steel and pipe producers have recently discontinued distribution of pipe on consignment basis to jobbers' account.

Boston—Demand for merchant steel pipe is heavy and, while quotas to distributors are substantially above pre-war levels, consumer requirements are not being met. Probably in pipe impact of f.o.b. mill pricing and selling is felt most, resulting in realignment of distributors and mill sources in Boston and north. There is no loss of tonnage as new suppliers take over accounts at former mill allocation levels. Inquiry by utilities is heavy and one or two mills, tightening distribution through jobbers, are developing slightly more tonnage for that class of users. Cast pipe buying holds above usual seasonal level, partly due to extended deliveries.

Cleveland — Looking to the future, one pipe producer is suggesting to its customers located nearer another producer that they switch their pipe purchases where possible to the nearest source of supply.

With pipe in extremely heavy demand, transportation costs now do not discourage purchases but when supply catches up with demand buyers will be inclined to buy from the nearest source.

Within a week or two one producer will begin taking pipe orders for 1949 from mill customers. Because this company's pipe output in 1948 is failing to come up to expectations, approximately three months in 1949 will be required to complete 1948 orders.

Reflecting the recent increase in price of zinc, galvanized pipe prices were raised $1 a ton by Republic Steel Corp., Oct. 28.

Plates . . .

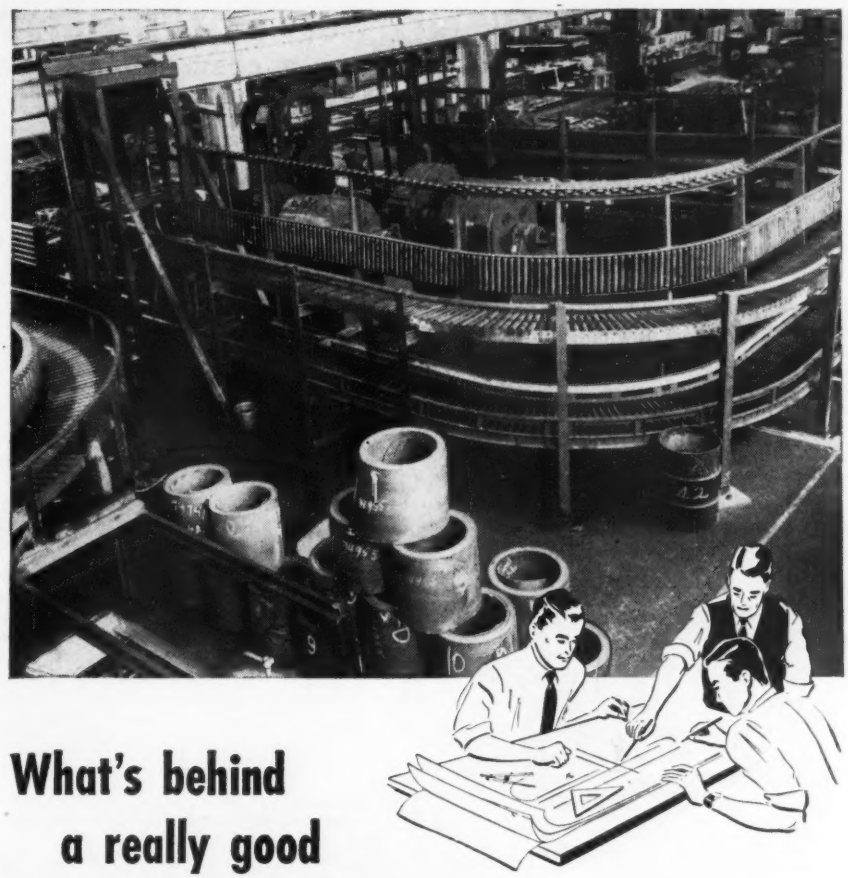
Plate Prices, Page 141

Boston—Additional plate tonnage for merchant ships will play further hob with first quarter distribution with releases against certificates heavier for warcraft, including destroyers being built at Bath, Me. Plates, allocated on a capacity rather than production basis, are going to voluntary programs at an estimated rate of 38 per cent. Carryovers in miscellaneous tonnage will be heavy at the yearend as numerous mills are unable to make headway on backlogs and are behind on delivery schedules. Higher ratio of plates covered by allocation certificates includes high tensile and galvanized. Mills, until recently on a quarterly quota schedule, will operate on monthly basis next quarter. As in most other products, where quotas are being setup, only January is covered.

Pittsburgh — Demand-supply situation in plates is growing tighter, according to consumers not coming within the scope of voluntary allocation programs. Increased tonnage of plates is expected to be channeled into preferred industrial groups as indicated by the consideration now being given to 10,000 additional tons for the Maritime Commission for January and February. Rescheduling of the freight car program also is under consideration, with more tonnage of plates and less of sheets for this program likely for first quarter. Fabrication of fuel standby tanks has been retarded by scarcity of plates, while an important factor in overall shortage of the latter is attributed to tremendous line pipe demand requiring relatively high percentage of plate production.

Philadelphia — While most leading plate producers have not as yet opened books on noncertified tonnage for shipment beyond this year, some have entered commitments for January and are accepting a little for the following month. In the case of certified tonnage, most producers, to all practical intents and purposes, have committed themselves on tonnage up until the end of February when Public Law 395 is due to expire. On certain defense requirements, the mills have committed themselves for still another six months on the basis of present allocations, should the steel be deemed necessary and even should there be no extension of the law, which is regarded as questionable. At present, there is a lack of balance between shipments of certain products under certified allocations, which among other matters came in for review of government and steel representatives in Washington last week. One apparent difficulty was that sufficient lead time was not allowed in some cases to permit full shipment of certified quotas for the month just ended.

Chicago — In the opinion of many steel producers and distributors, the product in shortest supply is plates, forcing curtailments in some industries which are not benefitting from the allocation program. A builder of heavy machine tools, for example, has complained plate receipts are so low that delivery schedules on new large presses cannot be met. Construction has begun at 3251 S. Cali-



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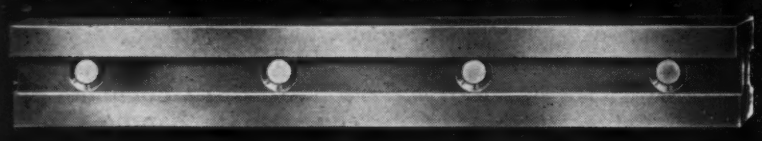

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Birmingham — Plate production, even at virtual capacity, seems to make little inroad into accumulated needs. Indicative of the shortage was announcement last week from a Gulf Coast shipbuilder that most of his contracts were virtually in suspense.

Structural Shapes . . .

Structural Shape Prices, Page 141

New York—September structural bookings, according to the American Institute of Steel Construction, were 174,671 tons, an increase of 5 per cent over the previous month and 30 per cent over September a year ago. They brought the total for the first nine months up to 1,477,493 tons, against 1,192,605 tons for the corresponding period of 1947.

Shipments were slightly lower than in the preceding month at 158,841 tons, although the total for the first nine months was higher at 1,448,938 tons, an increase of 77,901 tons over the corresponding period of last year.

Fabricators backlogs for the next four months increased to 698,230 tons, as of Oct. 1.

Contract figures for August and July have been revised to 166,051 and 174,682 tons, respectively. Shipment figures for those months also have been revised to 167,174 and 157,264.

Structural buying is featured by a heavy amount of New York state bridge work, including 14,000 tons for a viaduct in Kings county. Contracting also includes 2800 tons for a naval hospital addition at St. Albans, Long Island.

Boston—Allocation of plain structural steel is substantially below demand, including junior beams and light special shapes as well as standard sections. District fabricating shops are more cautious in estimating smaller tonnages as to delivery promises; some contracts are behind schedule with shops over-committed. Deliveries with larger units are five to six months. Less volume is up for estimating, including both private and public work.

Philadelphia—One leading shape producer has established consumer quotas for January, but likely will move slowly on quotas for the remainder of the quarter until after definite information is available as to whether or not Public Law 395 will be extended beyond its present expiration date of Feb. 28.

Meanwhile, demand is pressing, with the situation aggravated by the fact that some tonnage moving under voluntary allocation is not being used because end-use production is being retarded by inadequate supplies in certain other products. This situation is particularly true at certain of the car shops.

Pittsburgh — Increasing volume of structural fabrication work is being held up due to growing scarcity of structural sections. Most fabricators

will only bid on new work on basis of specified delivery time after receipt of necessary steel.

Chicago — Balance between supply of and demand for plain shapes is still a long way from attainment, but there are appearing some indications of the gap's closing, at least at present high construction costs. Inquiries are falling off and while order backlogs continue large enough to insure no immediate slackening in fabricators' operations the let-up in pressure from new work is resulting in a noticeable lack of interest in gray market tonnage.

Birmingham—An upsurge in shape demand is evident in the territory served by local mills, according to reports this week. Some fabricators have fair stockpiles and are reasonably busy, but the rule is not general, others having practically no inventories as compared to current needs.

Seattle — Fabricating operations continue normal, due to sizable order backlogs, although production is being retarded by slow delivery of materials, considerable tonnage still being held aboard strike-bound ships.

Semifinished Steel . . .

Semifinished Prices, Page 140

Cleveland — Demand for steel ingots for conversion continues undiminished. This trade is being watched closely for it is expected to give one of the first indications of a drop in overall demand for steel. A great portion of the conversion ingots sold go to large consumers who also have mill sources of supply of finished steel. Because the final cost of conversion steel is considerably above mill prices for finished steel it is expected the conversion business will be the first to reflect consumer resistance.

Warehouse . . .

Warehouse Prices, Page 143

Boston—Distribution of stainless through warehouse borders on chaos with wide range of prices, loss of discounts and varying mill quotations prevailing. Most jobbers are marking up warehouse prices on basis of the supplying mill's price policy. All carbon products are in short supply and demand is far in excess of stocks. Notably short are plates, structurals, light bands and flat-rolled.

Pittsburgh — Distributors of alloy products have adjusted their prices in line with revisions recently announced at mill source. One interest also reports that functional discount on stainless steel recently has been eliminated by its supplier on shipments for stock; on shipment direct to customers, the discount is still allowed. It will be recalled that some stainless steel producers entirely eliminated the functional jobber discount some time ago, while others delayed action until relatively recently. No improvement in jobber inventories was recorded during October and the outlook is less promising over the coming months. Price range of 5 to 15 cents per 100 pounds still prevails on most products among distributors here.

Philadelphia — District warehouses wound up another good month in October, with one large distributor reporting sales as the heaviest this year on a tonnage as well as value basis. However, tonnage volume is down from a year ago, distributors ascribing this fact to lighter mill receipts.

Cleveland — Although demand on warehouses for steel shows no easing, some consumers are displaying more price consciousness and are increasingly critical of quality. However, warehouse stocks as a whole are still inadequate. Particularly scarce are cold-finished carbon bars, it being reported that nonintegrated mills producing them are unable to obtain sufficient hot-rolled bars. Warehouse supplies of hot and cold-rolled sheets also are unimproved. Following mill increases in extras on alloy bars, warehouses last week were making upward revisions in their prices on this product.

Chicago — Warehouse inventories are lower for the heavier products, plates, large sheets and structurals, than for small bars and bar size shapes, a situation which arises out of the larger tonnage requirements of plate and shape fabricators compared with users of lighter products. Few customers, however, are able to satisfy their needs fully from any one source since proper inventory balance is impossible to maintain under present conditions. This situation undoubtedly will worsen over coming months when "free" tonnage of certain products declines as the

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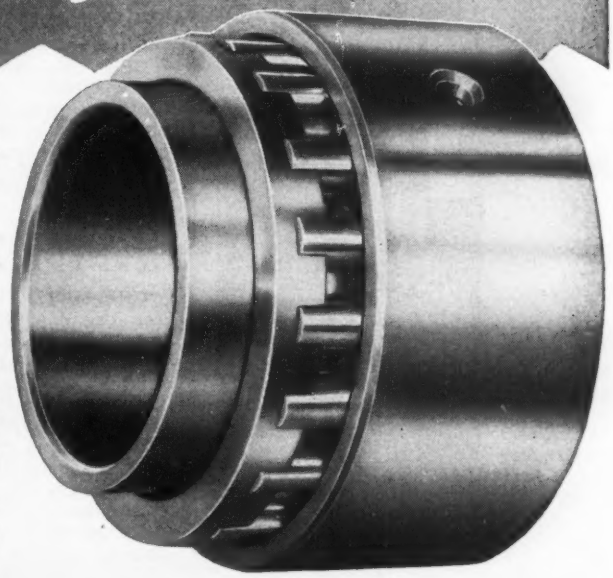

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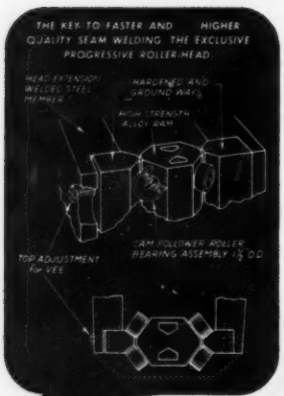
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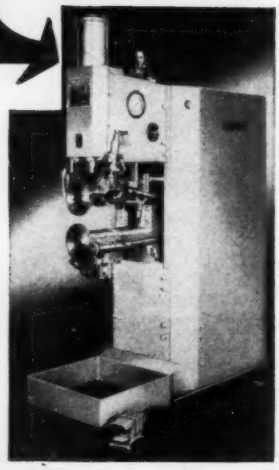

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result of allocations.

Cincinnati — Warehouse stocks are seriously out of balance, mill shipments of wanted steel being distributed as rapidly as received. Demand for cold-finished bars has soared, against an inadequate and unchanged supply situation. Shortage of heavy plates is critical. A feature of the market is the expanding needs for coal mines.

Birmingham—Warehouse stocks are declining fractionally, even in the face of already exceedingly short supplies. Mills hold fast to the theory that established customers must be served, regardless of location.

Seattle—Jobbing houses report a strong market and stable price lists. In some instances jobbers are absorbing certain freight increases in order to stabilize the situation, and adjust differences between delivered prices of coast-produced materials and those coming from distant points. This applies in some measure to the increase in railroad shipments over the freight involved in the present stalemated intercoastal water service.

Rails, Cars . . .

Track Material Prices, Page 141

Pittsburgh — Rescheduling of steel allotments to the railroad carbuilding industry is expected for first quarter, with more tonnage of plates and less of sheets indicated. It is pointed out that the freight carbuilding program is being concentrated more and more in railroads' own shops.

New York—Pennsylvania Railroad has placed orders for 145,600 net tons of new steel rail, costing $9,100,000 for delivery in 1949. The orders were placed with Carnegie-Illinois Steel Corp., Pittsburgh, Bethlehem Steel Co., Bethlehem, Pa., and Inland Steel Co., Chicago.

Chicago — Declining trend in new freight car ordering has been partially attributed to the present high cost of new units. To overcome this stumbling block railroads are increasingly planning on placing new orders with their own shops.

Iron Ore . . .

Iron Ore Prices, Page 142

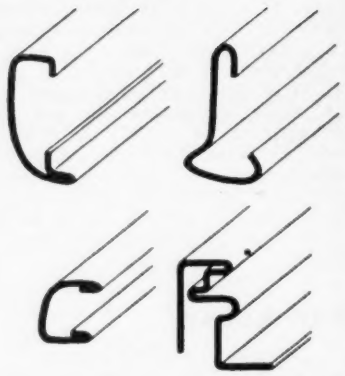
Cleveland—Average daily rate of iron ore consumption increased during September over the previous month's rate, although the total was smaller due to the shorter month. Total consumption came to 6,965,392 tons in September compared with 7,036,135 tons in August and 6,491,937 tons in September of last year, according to the Lake Superior Iron Ore Association.

Consumption for the first nine months totaled 58,822,093 tons compared with 59,516,825 tons for the like period a year ago.

As of Oct. 1, United States furnaces in blast totaled 170 compared with 171 as of Sept. 1 and 172 as of Oct. 1, 1947, while those idle totaled 14, 13 and 11, respectively. In Canada, 9 furnaces were in blast and 1 was idle on those dates.

Total stocks of Lake Superior iron ore totaled 40,923,499 tons as of Oct. 1, compared with 37,080,989 tons as of Sept. 1 and 38,369,549 tons as of Oct. 1, 1947.

ROLLS



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Pig Iron . . .

Pig Iron Prices, Page 142

New York — Pig iron importations have been coming in along the eastern seaboard at an increasing rate. During the first half of this year these arrivals amounted to little less than 50,000 tons. In July importations amounted to approximately 17,000 tons, officially reported by the Department of Commerce. However, unofficial figures indicate an increase in August and a further increase in September, with tentative reports for the first half of October on an even higher basis. Actually, according to one leading trade source, imports for four weeks beginning with the last week in September have amounted to approximately 36,000 tons.

It is believed, however, that importations will start leveling off late this year, especially with the New England producer expected to get into operation in the early part of November.

Boston—Initial Mystic production, first since early July, is being spread thinly to meet emergencies; critical position held by most foundries for nearly four months is on the mend. While there have been curtailments, few foundries, if any, actually closed because of lack of iron. Arrivals of foreign iron have been substantial of late against orders placed late in the summer, but bulk of this tonnage is held by about six of the largest melters. While melt is below peak, there is no easing of iron supply in sight. Melt could go down considerably without affecting iron demand as most shops will correct high scrap ratios with more iron in mixtures as soon as possible. Rejections and machining difficulties add materially to costs.

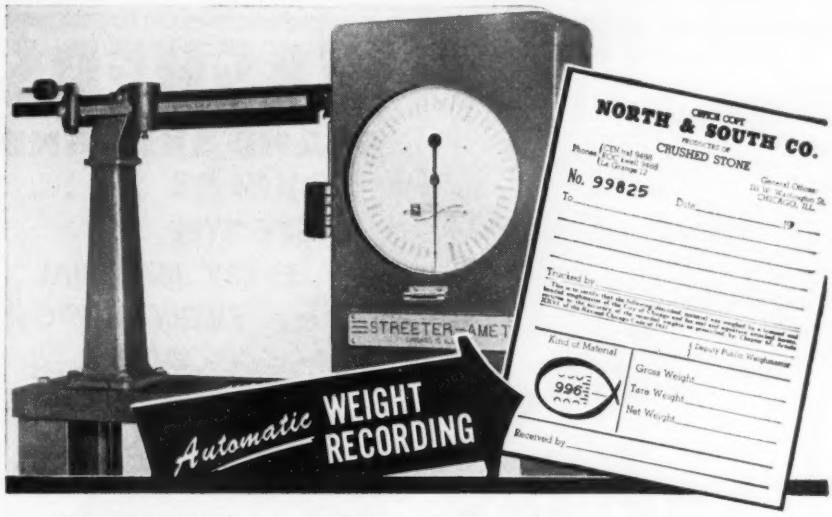
Pittsburgh—Carnegie-Illinois Steel Corp. blew out its No. 3 blast furnace at Carrie Works, Rankin, Pa., Oct. 20, leaving 43 out of 47 units active in this district. Jones & Laughlin has 2 out of 11 furnaces out of service, with result this company is short of hot metal. Supply of merchant iron shows no signs of improving, with relatively little tonnage shipped into this area. Leading merchant iron producer here continues to produce well below rated capacity due to poor quality coke.

Philadelphia—Pig iron supply is a trifle easier, with importations a contributing factor. Within the past three weeks, foreign arrivals have included at least three modest tonnages of Indian iron. These shipments, along with one of 1100 tons late in September, are the first to have been received from that country since before the war.

The leading district merchant producer last month was able to step up production of foundry and malleable to normal volume and looks for an equally good performance in November.

Woodward Iron Co., Birmingham, Ala., has blown in a furnace which had been down for repairs, restoring output for this company to full production. While this furnace had been under repair, output had been reduced by about one-third.

Buffalo—Having completed a $1 million investment in a new turboblower, Republic Steel Corp. relighted



The M-118-D is a new Automatic Recording Weigher that prints and visually indicates dormant loads with rapidity and accuracy. The price fits the budgets of small business, yet meets the most critical demands of large industrial jobs.

The capacity is from 1,000 to 100,000 pounds. Accuracy and precision are built into this Automatic Weigher.

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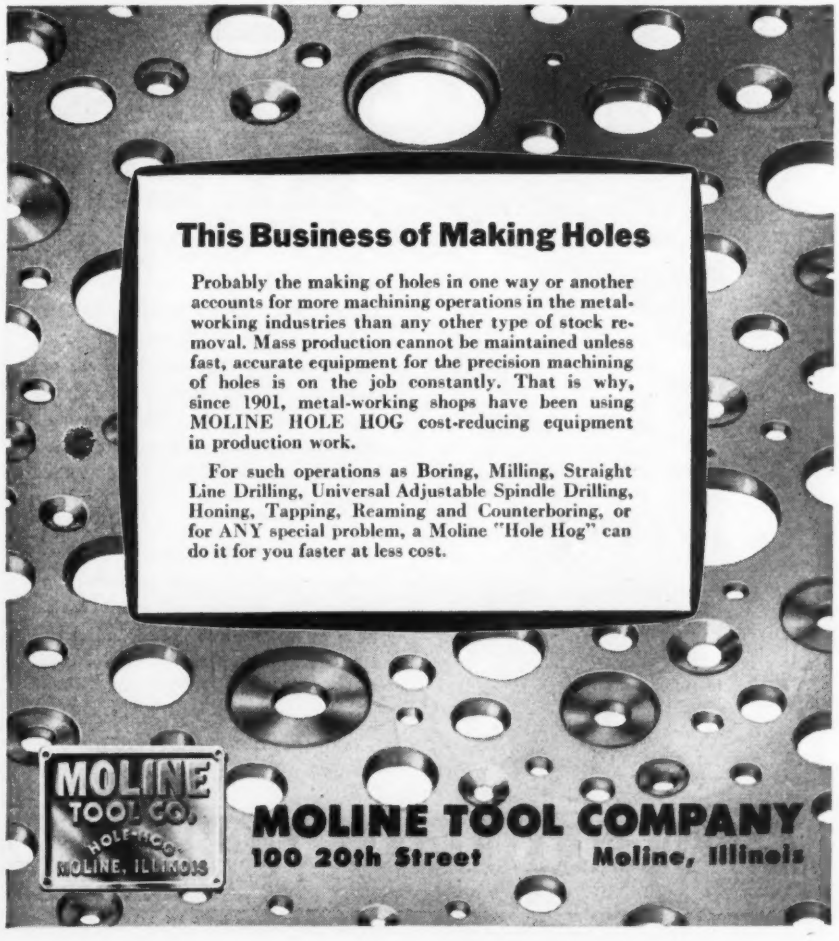
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Probably the making of holes in one way or another accounts for more machining operations in the metal-working industries than any other type of stock removal. Mass production cannot be maintained unless fast, accurate equipment for the precision machining of holes is on the job constantly. That is why, since 1901, metal-working shops have been using MOLINE HOLE HOG cost-reducing equipment in production work.
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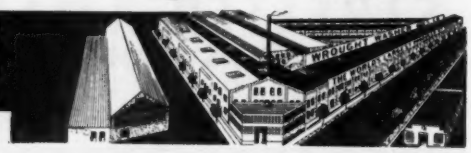

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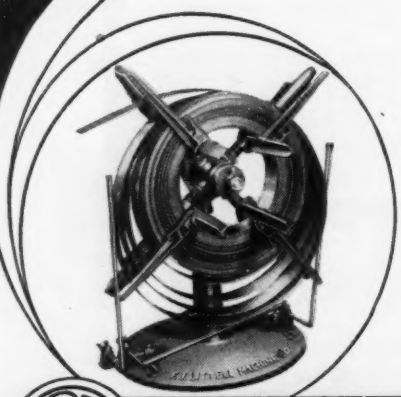
Easy-running, ball-bearing, self-centering, adjustable stock supports—are among the features of Littell Reels. Plain or motor-driven Reels. Coil capacities up to 6,000 lbs. Cradles for coils up to 20,000 lbs. x 72" wide.

Request Bulletins



SPEED WITH SAFETY
F. J. LITTELL MACHINE CO.
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its No. 2 blast furnace during the week. The blower will boost production 20 per cent. The furnace had a 900-ton daily capacity.

Chicago — Last local interest to come into the fold of pig iron producers who raised their prices this month is Wisconsin Steel Co., its prices now are $46.50 for malleable, $46 for foundry and basic. Production of the latter grade, however, is absorbed almost entirely by the company's steelmaking operations, to make this price virtually nominal. The already tight iron supply will contract still further in December when one leading producer takes a furnace off blast for relining and to stretch its iron ore supply over the winter.

Cincinnati — Pig iron supply situation is deteriorating to the point where some foundries are facing shutdowns. Shipments of southern iron are slower with some furnaces hesitant to make delivery promises.

St. Louis—Pig iron pinch has been unusually bad on consumers here the last two weeks due to delays in completion of Missouri-Illinois Furnaces Inc.'s relining job on one stack. Most users had been relatively well prepared for a two-month reduction of around 55 per cent in their shipments, but the third month caught many seriously short. Numerous foundries have gone from a five-day to four-day work week as a result. After a week's drying period, Mo-Ill's second stack is to be blown in Nov. 3 with full consumer deliveries to be resumed about mid-November.

Scrap . . .

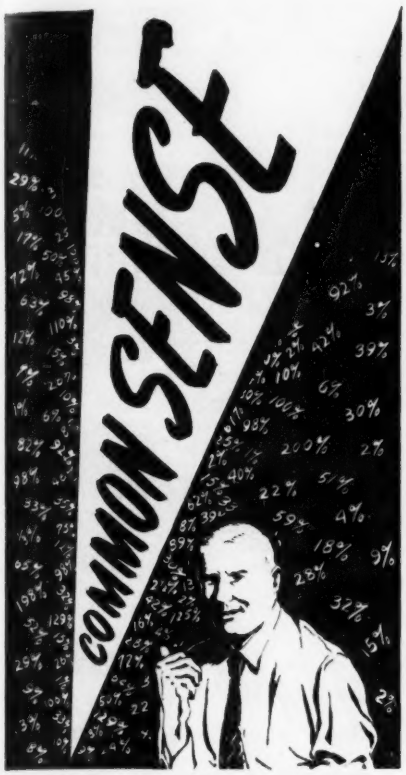
Scrap Prices, Page 146

Buffalo — Obviously disappointed over the continued refusal of leading mills to break the deadlock in the scrap market by raising the formula, local dealers have increased their sales to consumers in the Pittsburgh and Valley sectors. Dealers claim it is impossible to accept new orders at the prevailing price of $42.25 a ton for No. 2 heavy melting when supplies are not available in collection channels at such a price. Deals with outside buying interests are made at $1.50 to $2 a ton above the quoted range.

Prevailing quotations on steelmaking grades became somewhat nominal when little tonnage appeared to be moving strictly on such a basis. In addition to outside sales, a large portion of current deliveries are on conversion deals.

Pittsburgh — Continued improvement in scrap inventories is noted among leading consumers, with one interest reporting stocks double those of a year ago. Another mill states that shipments during August, September and October exceeded any three-month period in the last two years. Smaller mills are still reaching out for scrap from remote points, in contrast with the policy of some large mills to restrict springboard to $1. However, most consumers are still adhering to $2.50 freight absorption. One mill has purchased sizable tonnage of turnings for November delivery at $39, or $1 below formula.

New York — Scrap brokers' buying prices are steady, with shipments a shade tighter, due not only to scarci-



COMMON SENSE in the shop would seem to call for careful cutting fluid application, because oil that improves one operation may not be right for something different. *There just isn't any "one shot" cutting fluid that can do a large percentage of all jobs!* Consider all the variables—the wide variety of speeds, feeds, materials, tolerance and finish requirements encountered in machining operations in one shop. Those are the considerations that make it economical in the long run to be sure the cutting fluid you use is scientifically correct. "On-the-job" tests help you determine what cutting oil qualities are needed, and may even result in a decrease in the number of oils now used. It is plain common sense to call in cutting oil experts . . . people with a sound background of practical experience who can be relied upon to recommend the right cutting fluid for the job.

—Chip

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Solvol is more than just a high grade, emulsifiable cutting fluid. It is a unique super soluble product with the extra metal cutting qualities that will solve some of your machinery problems and help eliminate production headaches. Ask for literature.

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ty of cars but to the fact that less yard scrap is being offered. Some trade interests state that collectors are "scraping the bottom of the barrel" and that domestic supplies from now on into the winter are likely to show little betterment.

Boston — Steel and cast scrap prices are steady and unchanged with premiums the exception rather than the rule. Open-hearth scrap buying is fairly active, but cast is moving in smaller volume. Smaller foundries are buying, but larger melters have built up inventories. There is dearth of automobile scrap with car wrecking inactive. One steelworks continues to fill a substantial part of its scrap requirements by shipbreaking.

Philadelphia — Scrap prices are unchanged, although local consumers of steel scrap complain of a tightening in supply over the past week or so. This is attributed to scarcity of gondolas and to smaller receipts of light iron at the yards for bundling purposes. The more rigid specifications that are being enforced on bundled scrap are said to have caused collectors to move more cautiously in gathering this scrap; hence, the smaller volume.

However, importations are still being noted, with 9400 tons of German scrap having been received last Wednesday for the account of United States Steel Corp. subsidiaries at Pittsburgh. This is the first arrival of German scrap for these interests. Another cargo of foreign scrap, involving 8600 tons, is also being unloaded here for ultimate distribution among local district mills. The leading eastern consumer is expecting a cargo of Japanese scrap to arrive at this port early in November. It is understood that this will be alloy scrap. In addition, this interest has a cargo of foreign scrap scheduled to come into New York in the near future and is taking in several cargoes at Baltimore over the next few weeks. Actually, substantial tonnages are being unloaded there now.

Cleveland — Mill inventories of open-hearth scrap are considerably better now than at this time last year. Because of this improved condition there are fewer instances where consumers are paying over the formula prices. Most over-the-formula payments are now for production of conversion deal ingots. Mills are continuing to receive offers of European scrap.

Prices of cast iron grades continued strong, with a few upturns last week when a number of foundries came into the market for supplies. No. 1 cupola rose $1, making prices here $75 to $77; stove plate went up $2, and brake shoes, $1 to $2.

Chicago — Tranquility, almost to the point of stagnation, rules over the scrap industry here; prices have shown barely perceptible movement in recent weeks, with only a few cast grades and railroad items taking part; tonnage flow apparently is sufficient as demonstrated by mills' ability to raise operations to the highest level since the war. Some dealers think volume of country scrap is slackening off now, a trend which should be intensified as winter nears.

Cincinnati — The district iron and steel scrap market lacks vigor, probably due to satisfactory inventories at mills and foundries. Prices, how-

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Saving Ways in Doorways
KINNEAR ROLLING DOORS

ever, are holding steady excepting in tonnage for electric furnace melt which is off about $2 from recent peak. Most dealers are moving collections promptly so that yard stocks are low against any possible step-up in demand during the winter.

St. Louis—Scrap market in this district continues quiet, with formula prices holding despite melters' need to begin heavier stocking for the winter months. Stockpiles of major users are holding their own, and considerable hope is held that arrival of foreign scrap on the Atlantic seaboard will relieve the drain on the midwest and enable the latter to improve its inventory position.

Seattle—Mills are losing ground in the struggle for steel scrap. The present price of $27.50, f.o.b. mill, is firm and is considered high enough to keep out eastern buyers. However, it has not stimulated shipments in the volume expected. In view of capacity operations, scrap is not keeping pace and some anxiety is expressed over the potential receipts during the winter when shipments normally decline. It is reported that some dealers have accumulated stocks of considerable size which are being held in the expectation of another price increase. In some quarters the prediction is made that before long the Coast price level will equal that of the eastern market.

Cast iron scrap has again advanced and foundries are now paying $50 a ton on the average, previous market level having been $45. Buyers do not expect scrap to maintain this level as it is in fair supply and pig iron is again being shipped from Geneva.

Canada . . .

Toronto, Ont. — Canadian production of steel ingots and castings showed a favorable gain in August over the previous month while pig iron output attained the second highest total in history being exceeded only by May of this year. During August output of steel ingots and castings was maintained at a daily average rate of 81.6 per cent compared with 76 per cent in July.

Pig iron output in August amounted to 191,383 net tons, or a daily average of 82.1 per cent compared with 80.6 per cent in July and 71.6 per cent for August, 1947.

Ferroalloys produced in August amounted to 12,700 net tons.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

14,000 tons, Meeker Ave. link viaduct, Kings county, New York, for the state, to American Bridge Co., Pittsburgh.

2800 tons, naval hospital additiona, St. Albans, Long Island, to Harris Structural Steel Co., New York.

2500 tons, power plant, New England Power Co., Salem, Mass., to Bethlehem Steel Co.

2000 tons, state overpass, Rockville Center, Long Island, to American Bridge Co., Pittsburgh.

1700 tons, addition, Brookhaven National Laboratory, Brookhaven, Long Island, to Bethlehem Steel Co.

1000 tons, sports arena, Milwaukee, to Milwaukee Bridge Co., Milwaukee.

1000 tons, state bridge work, Saratoga county, New York, to American Bridge Co., Pittsburgh.

925 tons, shipping building, Johnson & John-

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TWO outstanding features of Layne Well Water Systems are—Higher Production and Lower Operating Cost. These advantages are the result of excellence in engineering design, plus the proper methods of installation. Such features are of utmost importance in all situations where ground water is used in large quantities: cities, factories, chemical plants, railroads, packing houses, steel mills, refineries, etc.

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son, Metuchen, N. J., to Harris Structural Steel Co., New York.

800 tons, power plant, Indianapolis Power & Light Co., to Central States Bridge & Structural Co., Indianapolis.

625 tons, Divine Providence hospital, Williamsport, Pa., to Bethlehem Steel Fabricators, Bethlehem, Pa. This was erroneously reported recently as going to another fabricator.

600 tons, building, General Refractories Co., Olive Hill, Ky., to Bethlehem Steel Co.

535 tons, state bridge work, Schenectady, N. Y., to American Bridge Co., Pittsburgh.

400 tons, state bridge work, Westchester county, New York, to Bethlehem Steel Co.

350 tons, warehouse and office building, Morre & Handley Hardware Co., Nashville, Tenn., to Southern Steel Works Co., Birmingham; Daniel Construction Co., Birmingham, general contractor; Connors Steel Co., awarded 75 tons concrete reinforcing bars.

300 tons, military science building, University of Connecticut, Storrs, Conn., to American Bridge Co., Pittsburgh; N. Benenuti & Sons, New London, Conn., general contractor.

260 tons, deck plate girder bridge, Stonington, Conn., to Bethlehem Steel Co.; N. Benenuti & Sons, New London, Conn., general contractor.

150 tons, ice cream plant, Schenectady, N. Y., to American Bridge Co., Pittsburgh.

125 tons, power house, Waupon, Wis., to Vulcan Mfg. Co., Fond du Lac, Wis.

100 tons, building, Bronx, New York, to Grand Iron Works, that city.

100 tons, Eastern Washington government project, to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

2000 tons, power house, Delaware Power & Light Co., Edgemoor, Del.

1300 tons, bridge superstructure, Annisquam river, Gloucester, Mass.

1000 tons, mine shaft and miscellaneous construction, New Jersey Zinc Co., Friedensville, Pa.

650 tons, approximately, Taramus Hospital, Jersey City, N. J., bids Nov. 12; York & Sawyer, 101 Park Ave., New York, architects.

645 tons, state bridge work, Washington, Fayette and Westmoreland counties, Pennsylvania; bids Nov. 12.

400 tons, transmission towers Seattle City Light Department; Bids Nov. 9.

350 tons, plant addition, Lansdale Tube Co., Lansdale, Pa.; bids closed Oct. 27.

330 tons, boiler house, General Electric Co., Lynn, Mass.; Stone & Webster Engineering Co., Boston, contractor-engineer.

300 tons, Seattle warehouse for National Hardware Stores Inc.; bids soon to Young & Richardson, architects, Seattle.

220 tons, E. I. du Pont de Nemours, project 6408, Niagara Falls, N. Y.; bids asked.

105 tons, state bridge work, Potter county, Pennsylvania; bids Nov. 12.

100 tons, eastern Washington government project; bids in.

Unstated, miscellaneous steel for cable trays, etc., Coulee dam; bids to Bureau of Reclamation Nov. 16.

REINFORCING BARS . . .

REINFORCING BARS PLACED

425 tons, substructure, state bridge, Housatonic river, Shelton-Derby, Conn., to Truscon Steel Co., Youngstown, O.; Mariani Construction Co., New Haven, Conn., general contractor.

150 tons, Whatcom county courthouse, Washington state, to Northwest Steel Rolling Mills Inc., Seattle; Chisholm & Euford, Bellingham, general contract.

125 tons, road spans and miscellaneous, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, sewer outlet, Bremerton, Wash., to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

Unstated, Seatttle Gorge diversion dam, $1

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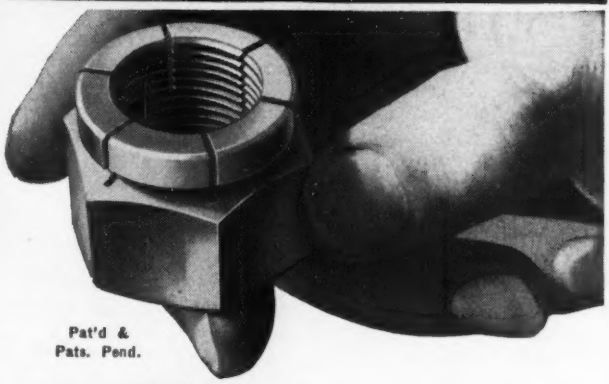

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The one-piece, all-metal, resilient "Flexloc" is becoming widely accepted, because it is processed to have an exceptionally uniform torque, and because it is a stop, a lock and a plain nut all in one. All its threads are "live" and load-carrying; "Flexloc" accommodates itself to a wide range of thread tolerances, and can be used over and over again without losing much of its torque . . . is not affected by temperatures commonly met within the industrial field of Mechanical Engineering . . . and being a "stop" nut, it stays locked in any position on a threaded member . . . and last, but not least—it won't shake loose!
The *Thin* "Flexloc" has become very popular because its *tensile* is so high and the space it occupies so small.
Sizes from #6 to 2" in diameter—in "regular" and "thin" types—in NC and NF thread series. Write for "Flexloc" Catalog.

OVER 45 YEARS IN BUSINESS

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million project; bids to Seattle Oct. 28.

Unstated, state spans and viaducts in Douglas, Lane and Lincoln counties, Oregon; bids in at Portland, Nov. 4.

Unstated, state bridge Wibaux county, Montana; general contract to Roe Construction Co., Bismarck, N. D., low $46,949.

Unstated, parochial school, St. Paul's church, Yakima, Wash., $825,000 project; bids to John W. Maloney, architect, Seattle, Nov. 17.

Unstated, addition to public library, Seattle; S. S. Mullen Inc., Seattle, low, $338,800.

Unstated, control and oil house, Snohomish, Wash.; bids to Bonneville Power Administration, Portland, Nov. 4.

Unstated, branch bank at Kennewick, Wash., for National Bank of Commerce, Seattle; general contract to H. Halvorson, Inc., Spokane, Wash., low $157,315.

PLATES . . .

PLATES PLACED

100 tons or more, 500,000-gallon water tank and supply line at Bonneville Dam; general contract to Gunderson Bros. Engineering Corp., Portland, low $52,817.

Unstated, 66 inch outlet pipe, gates, hoists, etc., Cascade Dam, Idaho; general contract to Humphrey-Ketcham Co., Boise, low $39,-901.

PLATES PENDING

Unstated, 96 inch outlet pipe, Hungry Horse Dam project; bids to Bureau of Reclamation, Nov. 9.

PIPE . . .

CAST IRON PIPE PLACED

1200 tons, six to 16-inch, Metropolitan District commission, water division, Hartford, Conn., to United States Pipe & Foundry Co., Burlington, N. J.

1130 tons, 6, 8, and 12-inch, Worcester, Mass., to R. D. Wood Co., Florence, N. J.

RAILS, CARS . . .

RAILROAD CARS PLACED

Canadian Pacific, 500 fifty-ton box cars, to National Steel Co., Hamilton, Ont.

Chicago, Rock Island & Pacific, 100 covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Great Northern, 100 covered hopper cars and 100 general service gondolas, to Pullman-Standard Car Mfg. Co., Chicago.

Green Bay & Western, 20 fifty-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Southern Railway, 50 fifty-ton box cars, to Pullman Standard Car Mfg. Co., Chicago; this total was erroneously reported last week as amounting to 500.

RAILS PLACED

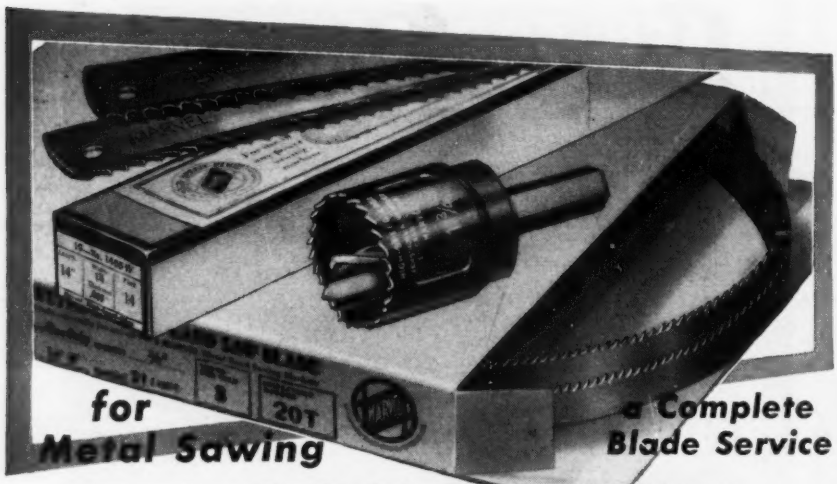
Pennsylvania, 145,600 net tons of rail for delivery next year, placed with Carnegie-Illinois Steel Corp., Pittsburgh, Bethlehem Steel Co., Bethlehem, Pa., and Inland Steel Co., Chicago; of the total specified, 90,000 tons are for two recently designed sections, weighing, respectively, 155 pounds and 140 pounds to the yard; remainder calls for 133-pound sections.

RAILS PENDING

Missouri Pacific, 43,310 tons of 115-pound rail and 4550 tons of 132-pound rail, court approval granted for purchase of rails, ties, spikes and other accessories.

LOCOMOTIVES PLACED

Canadian Pacific, 23 diesel-electric locomotives, placed; of this total, American Locomotive Co., New York, will build twelve 1500-horsepower freight engines, five 1500-horsepower road switch engines, and three 1000-horsepower yard switch engines, and the Electro-Motive Division, General Motors Corp., La-Grange, Ill., three 2000-horsepower passenger units.



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MARVEL High-Speed-Edge Hack Saw Blades are both high-speed and *positively unbreakable*. Composite construction (high-speed-steel cutting edge welded to tough alloy body) permits higher cutting speed, heavier feeds, tauter tensioning and assures long blade life.

MARVEL High-Speed-Edge Hole Saws have extra strength needed for drill press and lathe use. Rapidly cuts holes from ⅝" to 4½" dia., to depth of 1⅛" in steel.

MARVEL Band Saw Blades come individually boxed—protected against kinks or rusting—to exact size for each make and model sawing machine.

Write for MARVEL Saw Blade Catalog.

Metal Cutting
MARVEL SAWS
Better Machines—Better Blades

ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
5700 Bloomingdale Ave. Chicago 39, U. S. A.

CONSTRUCTION AND ENTERPRISE

ARIZONA

AJO, ARIZ.—Phelps Dodge Corp., Robert G. Page, president, 40 Wall St., New York, has awarded a contract to Foley Bros., Vermilyea St., Pleasantville, N. Y., for construction of a smelter plant.

CALIFORNIA

LONG BEACH, CALIF.—Hancock Chemical Co., an affiliate of Hancock Oil Co., W. J. Reid, president, 2828 Junipero Rd., will construct a $1 million plant at 23208 S. Alameda to separate sulphur from a gas that begins as hydrogen sulphide in oil refinery operations.

OAKLAND, CALIF.—Earle M. Jorgensen Co., 1657 22nd St., steel distributors, will expand facilities to include adjoining property which was purchased for $121,000.

OAKLAND, CALIF.—American Can Co., 37 Ave. and E. 18th St., plans to spend $250,-000 for an addition to its present building. Several new units of machinery will be added to increase operational facilities.

RICHMOND, CALIF.—United States Pipe & Foundry Co., East Burlington, N. J., is planning to build a $1 million manufacturing plant.

SAN FRANCISCO—Pacific Gas & Electric Co., 245 Market St., has awarded a $50 million contract to Bechtel Corp., 220 Montgomery St., for an electric generating plant near Sando.

SOUTH GATE, CALIF.—Pittsburgh Erie Saw Corp. is planning to construct a factory building at 5767 Imperial Highway; Ellis Wing Taylor, 803 West Third St., Los Angeles, architect.

FLORIDA

KEYSTONE HEIGHTS, FLA.—Clay Electric Co-operative Inc. has awarded a $1 million contract to Engineering Sales Corp., c/o E. P. McLean Engineering Co., engineers, Moultrie, Ga., for the construction of four substations.

GEORGIA

ATLANTA—Westinghouse Electric Corp., 1299 Northside Dr. N.W., plans to construct a $500,000 plant to manufacture electrical equipment.

ILLINOIS

CHICAGO—Illinois Bell Telephone Co., 212 W. Washington St., has awarded a $1,200,000 contract to W. E. O'Neil Construction Co., 2751 N. Clybourn St., for a warehouse addition.

CHICAGO—Chicago Rotoprint Co., 4601 Belmont St., has awarded a $240,000 contract to Nelson Builders Inc., 2136 W. Devon Ave., for erection of a storage building; E. P. Steinberg, 180 W. Washington St., architect.

LA GRANGE, ILL.—Citizens Publishing Co., 15 West Harris, has awarded the general contract for a printing plant building to the Lee Construction Co., 127 North Dearborn St., Chicago.

MARYLAND

BALTIMORE—A. Judd & Sons has acquired and equipped the building at 109 South Hollingsworth St. for metalplating.

MASSACHUSETTS

BOSTON—Penn Metal Co. Inc. has awarded a contract to the Plate Construction Co., Parkersburg, W. Va., for an addition to its main plant which will house new equipment installed under the expansion program now

FRONT LEVER BENCH PUNCH

Immediate Shipment

The endurance and practicability of this machine have established it as a favorite in the metal-punching trades.

●

Hand Operated **Weight 70 lbs.**
Capacity 3/16" hole through 1/4" metal

●

Punches and dies are carried in stock in a large range of sizes. New sizes are constantly being added to the line as the demand for them develops.

Present Range of Front Lever Punches and Dies

Round 1/16" to 1/2" by 1/64ths. and No. 30, No. 24, and No. 19 Drill Size

Flat	Regular Oval	Semi-Circular End Oval		Square	
3/8" x 1/4"	1/2" x 5/16"	1/2" x 5/16"	11/32" x 9/32"	3/8"	17/64"
5/16" x 1/4"	1/2" x 9/32"	1/2" x 9/32"	11/32" x 7/32"	11/32"	1/4"
5/16" x 3/16"	1/2" x 3/16"	1/2" x 7/32"	5/16" x 1/4"	21/64"	7/32"
1/4" x 3/16"	1/2" x 5/32"	1/2" x 3/16"	5/16" x 9/64"	5/16"	3/16"
	13/32" x 9/32"	1/2" x 5/32"	9/32" x 7/32"	9/32"	5/32"
					9/64"

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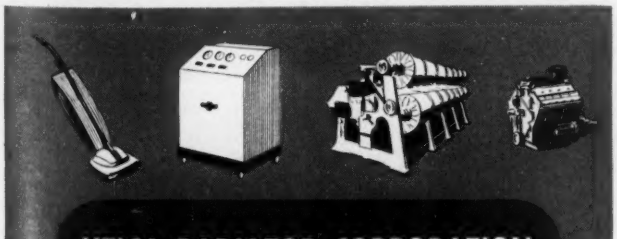

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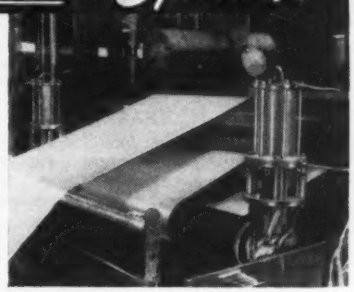
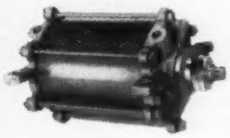


• No matter how special your requirements may be, you can meet virtually any need right out of the standard line of Hannifin cylinders. This is because the Hannifin line is COMPLETE! Any length stroke you want, double or single acting. Cushions for head end, rod end, or both. Ten standard bore diameters to choose from, ranging from 1" to 12". Larger or special types on order.

Hannifin flange mounted cylinders applying pressure on roll. Hammersley Mfg. Co., Garfield, N.J.

HANNIFIN

PNEUMATIC CYLINDERS

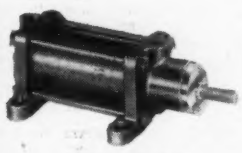


SERIES R

Series "R" Leakproof Cylinders feature the exclusive external packing adjustment design developed by Hannifin for positive assurance against air leakage and increased convenience in maintenance. Sizes 3" to 12" bore. Any length stroke. 6 basic mounting styles, plus a wide variety of combination styles, and double end piston rod models.

Hannifin Series "LW" Pneumatic Cylinders, featuring cup type piston packing, are preferred by many experienced engineers. Six standard sizes from 3" to 12". Any length stroke specified. Built in standard clevis, foot, base, trunnion, flange, and center line mounting styles. Also offered in a variety of combination and double end piston rod models.

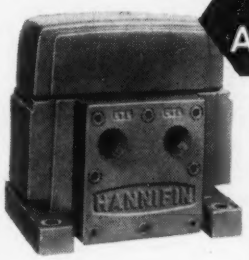
SERIES LW



SMALL BORE

Developed to meet the need for high quality 1", 1½", 2", and 2½" bore cylinders. Built with "LW" cup type piston construction: Six standard mounting styles. Any stroke desired. Also offered in combination and double end piston rod styles. In all Hannifin cylinders, standardized construction makes for lower engineering costs and quicker delivery.

A New Electric
AIR CONTROL VALVE



- **PUSH BUTTON CONTROL.** The modern way to operate air cylinders and other air powered equipment. Provides for 3-way or 4-way air flow.
- **POSITIVE, POWERFUL.** "Packless", pilot operated, solenoid controlled. Capable of 180, or more, cycles per minute.
- **SIZES.** ⅜", ½", ¾" and larger. Send for descriptive literature.

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PNEUMATIC PRESSES • HYDRAULIC RIVETERS • AIR CONTROL VALVES

Nationwide Sales and Service

under way. Also being erected is a pattern and die storage building and an addition to the office building at Parkersburg.

MICHIGAN

BELDING, MICH.—Gibson Refrigerator Co., Greenville, plans to build a $500,000 factory.

NEBRASKA

OMAHA, NEB.—Mead Farm Equipment Co., 1024 Dodge St., has awarded a $125,000 contract to Timmons Construction Co., 2508 N. 52 St., for erection of a warehouse at 800 S. 72 St.

NEW JERSEY

CAMDEN, N. J.—Texas Co. has awarded a contract to Wigton-Abbott Corp., engineers and contractors, Plainfield, for the design and construction of a storage building at its Eagle Point plant near here.

NEW YORK

NEW YORK—Nassau Terminal Corp., Benjamin Marvin, president, has awarded a $1 million contract to Fred T. Ley & Co. to construct a bus terminal, store and office building on the entire block bounded by Main St., Nichols Court, Jackson St., and Station Plaza, in Hempstead, L. I.; Harold Carlson, architect.

OHIO

ELYRIA, O.—Ohio Machine & Boiler Co., E. Paul Simon, manager, 1501 University Rd., Cleveland, has purchased the former Hahn Mfg. Co. plant on Race Rd. for expansion purposes. The company has installed new machines and will engage principally in the making of diesel electric locomotive gear casings.

MT. VERNON, O.—Cooper-Bessemer Corp. is planning to construct a $250,000 addition to its main office building here to provide more adequate facilities for its rapidly expanding research and engineering divisions.

PENNSYLVANIA

LEBANON, PA. — Lebanon Steel Foundry, Front and Lehman Sts., has awarded a $100,000 contract to Hughes Foulkrod Co., 1505 Race St., Philadelphia, for a scrap handling building.

PHILADELPHIA—John N. Galbraith, 42 E. Gay St., Columbus, O., is contemplating building a warehouse, garage and office to cost $1 million; plans by Tully, Hobbs & Hansen, 582 Oak St., Columbus, O.

PLYMOUTH, PA.—Philip Carey Mfg. Co., Lockland, O., is planning to construct a $2,700,000 manufacturing plant; Knowles & Associates, 19 Rector St., New York, architects.

TEXAS

DALLAS, TEX.—J. N. Fisher, Gulf States Bldg., is planning to remodel and recondition its cotton mill on S. Lamar St. at a cost of $300,000 and its masonry steel manufacturing plant at a cost of $750,000.

ELLA SWITCH, TEX.—Humble Oil & Refining Co., Humble Bldg., Houston, has awarded a $1,200,000 contract to Stearns-Rogers Mfg. Co., 1720 California St., Denver, for construction of a gas injection-compressor plant on King Ranch near here.

ETTER, TEXAS — Phillips Chemical Co., Bartlesville, Okla., is doubling the capacity of its ammonia plant at a cost of $8,500,000, and is spending $6,500,000 on its ammonia nitrate plant.

VIRGINIA

RICHMOND—Richmond Newspapers Inc., 110 N. Fourth St., has awarded a $500,000 contract to Doyle & Russell, Central National Bank Bldg. for construction of a mechanical plant; Baskervill & Son, Central National Bank Bldg., architects.

WASHINGTON

ANACORTES, WASH.—American Chrome & Magnesium Industries Inc., c/o A. L. Atherton Terminal Sales Bldg., Seattle, is planning to construct a $3 million chrome briquetting plant and concentration mill.

CANADA

CHALK RIVER, ONT. — National Research Council, C. J. MacKenzie, president, Sussex St., Ottawa, has awarded a $375,000 contract to Robertson Construction & Engineering Co. Ltd., 512 Clifton Rd., Niagara Falls, for construction of a laboratory building.

MONTREAL, QUE.—Canadian National Railways, B. Wheelwright, chief engineer, 360 McGill St., has awarded a $300,000 contract to J. S. Henson Ltd., 660 St. Catherine St. W., for a freight shed at Bonaventure Yards.

SOREL, QUE.—Quebec Iron & Titanium Corp. of Canada, 1522 Sherbrook St. W., Montreal has awarded a $15 million contract to Fraser Brace Engineering Co. Ltd., 360 St. James St. W., Montreal, for design and construction of an ore refinery, railway and wharves at Pointe aux-Pius.

VILLE LA SALLE, QUE.—Ross Engineering of Canada Ltd., 425 River St., Verdun, plans to build a factory and offices costing $500,000; Barott, Marshall, Montgomery & Merrett, architects; E. L. Glance, 5975 Monkland Ave., Montreal, engineer.

KINDERSLEY, SASK. — Saskatchewan Federated Co-operative Ltd., Regina, is planning to build a $1 million oil refinery.

PRICES OF LEADING FERROALLOYS PRODUCTS

(Continued from Page 143)

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.00c per lb of briquet, c.l. packaged 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.0c per lb of briquet, c.l. packed 10.8c, ton lot 11.6c, less ton 12.5c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (**Large size**—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 5.75c per lb of briquet, c.l. packed 6.55c, ton lot 7.35c, less ton 8.25c. Delivered. Spot, add 0.25c.

(**Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 5.90c, c.l. packed 6.70c, ton lots 7.50c, less ton 8.40c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 80.00c per pound of Mo contained, fob Langeloth, Pa.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.). Contract, ton lots, 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.28, less ton $1.35. Fob Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon (Ti 15-18%, C 6-8%). Contract, $160 per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21% C 3-4.5%). Contract, $175 per ton, fob Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5 max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c. **Crucible-Special Grades** (Va 35-55%, Si 3.25-4% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.), $3.10.

Vanadium Oxide: Contract, less carload lots, $1.20 per lb of contained V_2O_5, fob Bridgeville, Pa. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract. 100 lb or more. 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Contract, ton lot, 2" x D, $2.75 per lb of contained Cb, less ton $2.80. Delivered. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%; Zr 0.75-1.25%, C 3.50-5%). Carload, 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Carload, packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.25c, less ton 18.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 42-46%, Ca 5%, Ti 9%). C.l. packed, 16.50-17.00c per lb of alloy; ton lots 17.90-18.00c; less ton lots 19.40-19.50, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%). C.l. packed, 14.25c per lb. of alloy; ton lots 15.75c; less ton lots 17.00c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Sigio, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c. Effective Jan. 1, 1949, price will be $1.10, Langeloth.

Technical Molybdic-Oxide: Per lb, contained Mo, fob Langeloth, Pa., packed in bags containing 20 lb of molybdenum, 80.00c.